Index to Contents, September, 1940

(The Annual Index to Contents appears at the back of the December issue each year)

Architecture
Awards for Outstanding Local Architectural Excellence ... 91

Buildings, Public
Your Town's Old Buildings ... 59

Business and Industrial Development
Community Industrial Development and National Defense ... 48

Census, 1940
Avoiding Census Jitters ... 56
New Population Figures ... 83
The Census and Your City ... 111

Citizens and Government
A Live and Useful Town Forum ... 64

Civic-Commercial Organizations
Awards for Local Outstanding Architectural Excellence ... 91

Conventions
Conventions—When and Where ... 123

Defense, National
City Planning for National Defense ... 5
Protecting Jobs of City Employees Called for National Service ... 5
Community Industrial Development and National Defense ... 48
New England Survey Aids Planning, Defense ... 67
The Constant Defense of Fitchburg ... 95

Drainage
Booklet on Sub-Drainage ... 131

Finance and Taxation
"Soaking" the Big Cities ... 43
The Municipal Bond Market ... 111

Fire Protection and Control
What About Fire Insurance? ... 7
What are Fire Insurance Rates? ... 50

Forestry
Town Forests and Tree Planting ... 71

Forward Steps
Items Contributed by Officials and Others 91

Government and Administration
Protecting Jobs of City Employees Called for National Service ... 5
Civic Body Plans Merit Exam ... 46
Schools Defend American Way ... 61
The "Pros and Cons" of Municipal Consolidation ... 79
Vacation and Hospitalization Plans for City Employees ... 109
Wide Variation in Municipal Civil Service Agencies ... 109
The Only Municipal Weather Bureau in the United States ... 111

Health and Sanitation
Trichinosis Commission Created in N. Y. ... 13
Sanitation Outside Cities ... 58
The Constant Defense of Fitchburg ... 95

Housing
"The Homes They Come From" ... 53
FHA Studies Defense Housing and Neighborhood Rehabilitation ... 115

Legal Decisions
City Control of Charity Solicitation ... 109
Zoning and Planning Notes ... 113
Municipal Law Notes and Decisions ... 117

Lighting, Outdoor
Traffic Safety Lighting ... 103
Sports Lighting in a City Park ... 105
74 Years of Electric Street Lights ... 105
Toledo Steps Out of Arc-Light Era ... 107
Street-Lighting Costs ... 107
All But One Crash Was at Night ... 107

Motor Equipment
Municipal Garage ... 44

Parking Meters
Parking Studies in Bakersfield ... 49

Parks and Recreation
Local Re-creation ... 7
Transformation of Waterfront Follows Hurricane Havoc ... 91
Sports Lighting in a City Park ... 105
Power-Driven Lawn Sweepers ... 129

Planning and Zoning
City Planning for National Defense ... 5
Effective Planning Agencies Urgently Needed ... 5
Zoning and Planning Notes ... 113
New England Survey Aids Planning, Defense ... 67
FHA Studies Defense Housing and Neighborhood Rehabilitation ... 115

Police
When Handling Suspected Bombs ... 83

Power Plants
The Future of Municipal Power ... 7
Hamlets Boomed by Pocket Diesels ... 65

Publications
Municipal and Civic Publications ... 119

Public Relations
The Constant Defense of Fitchburg ... 95

Public Utilities
Future of Municipal Power ... 7
Putting Wires Underground—II ... 60
Hamlets Boomed by Pocket Diesels ... 65
Should Cities Distribute Milk? ... 75

Public Welfare
City Control of Charity Solicitation ... 109

Safety
Is Yours a Safe City? ... 7
Putting Wires Underground ... 60
When Handling Suspected Bombs ... 83
The Constant Defense of Fitchburg ... 95
Gas Mask with All-Vision Facepiece ... 135

Sewers and Sewage Treatment
Sewage Clarification by Pre-Flocculation 11
Storm Sewer Pumps at Schenectady, N. Y. 11
Large Sewer Program in Cranston, R. I. 62
Seven Years' Operation Data, Grand Rapids Sewage Works ... 66
Sludge as a Fertilizer ... 73

Snow Removal
Chasing a Snowstorm from a City's Streets 47

Street Construction and Maintenance
Municipal Garage ... 44
Spot Cash for CBM Street ... 52
Pressure Sprayer for Bituminous Materials 131
Easily Operated Concrete Mixer ... 135

Traffic Control and Facilitation
Illuminated Traffic Lines and Markers ... 7
Corner—or Suspended—Traffic Signals? ... 7
Keep Today's Traffic Moving ... 97
More Accidents at Un-Signed, Un-Signalized Intersections ... 101
Button Reflectors on Penn. Turnpike ... 125

Waste Collection and Disposal
Trichinosis Commission Created in New York ... 13
Low Complaint Record on Refuse Collection ... 13
Household Separation Aids Garbage Disposal ... 13
Charging Buckets at Pittsburgh New Incinerator ... 13
Garbage Disposal ... 69
Refuse Body Compacts Load of Bulk Rubbish ... 127
Cleveland's New Truck with Drop Frame 131
Pittsburgh, Pa., Has New Garbage-Collection Fleet ... 133

Water Supply and Purification
Important Dates in the Water-Works Field 9
A Remarkable Record in Bill Collection 9
Constant Improvements to Maintain Service ... 9
Water-Softening Plant, Hamilton, Ohio 9
Automatic Control of Treatment for Well Water ... 41
Water Treatment ... 54
Water-Supply Interruption ... 77
Small-Town Water Works ... 81
Water Rates and Service Charges—IX ... 85
Water-Lubricated Well-Pump Bearings ... 125
Water Aeration by Air Diffusion ... 129
Packaged Ammoniation Now Available ... 137

Waterfront Development
A Notable Waterfront Improvement ... 57
Transformation of Waterfront Follows Hurricane Havoc ... 91

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EDGAR J. BUTTENHEIM, President
HAROLD S. BUTTENHEIM, Editor
THEODORE REED KENDALL
Secretary and Engineering Editor
M. V. FULLER, Associate Editor
ALDEN W. WELCH, Research Editor
HERBERT K. SAXE
Treasurer
MYRON MacLEOD, Advertising Mgr.
PRENTICE C. FORD, Asst. to President

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Daily News Building, Chicago
GEORGE S. CONOVER, Vice-President
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IN THE MUNICIPAL INDEX AND ATLAS (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find statistical material, and articles on a wide variety of municipal and public works subjects, not published in the monthly issues of the magazine.

See pp. 17, 18, 21, 22, 24, 119, 121 for catalogs and publications on municipal and civic subjects

For Index to Advertisements see page 144

Picture courtesy Harper's Magazine.

October 11, 1882 . . . the first annual convention of the New England Water Works Association was opened at the Essex House, in Salem, Massachusetts. Thirteen active members of the Association were present, and applications for associate membership included the name of the National Meter Company. This Company thus became the first manufacturer of water meters to have the honor of membership in the New England Water Works Association. • It is with the pride of pioneers, therefore, that the National Meter Company extends its greetings to the New England Water Works Association at its fifty-ninth annual convention. NATIONAL METER COMPANY, 4201 First Avenue, Brooklyn, New York. Branch offices in Boston, Chicago, Dallas, Los Angeles, San Francisco, and Seattle.

Call at our booth for a copy of the booklet, "Revolutionary? Of course it was!" — which tells about the birth and growth of the water meter industry.

NATIONAL PERFORMANCE PROVED **METERS**

City Planning for National Defense

Effective Planning Agencies Urgently Needed

READERS of THE AMERICAN CITY *who are members of the American Society of Planning Officials will have received during August a timely memorandum from Walter H. Blucher, Executive Director of that organization. Most of it is here reprinted for the benefit of municipal officials generally—with the suggestion that brains and money for effective city planning are important assets of municipalities that possess them, and an urgent need wherever the importance of the planning function has not yet been recognized.*

From the ASPO statement:

Information which will be essential to a defense program will consist, among other things, of knowledge of the number of vacant residences available, their condition, rental, and relationship to industrial areas. In many cases such information can be obtained from housing authorities. Where new housing programs are to be undertaken, it is important that we know whether sewers and water are available, what transportation is available or can be readily obtained, the relationship of such new proposed residential areas to shopping centers and to schools, the existing capacity of schools for new pupils, etc.

There should be an immediate study of available industrial plants as to their condition and suitability for modern use—not only physical suitability, but also their relationship to transportation and available housing.

Planning agencies must have a knowledge not only of existing physical resources but of human resources as well. What persons are available in the various professions, skills, and trades to undertake particular work? Much of this information will already be available in relief and employment agencies. What transportation facilities are available, and will it be possible without great cost and without loss of time to augment those facilities in particular areas?

These are but a few of the things which planning agencies must know.

Importance of a Long Look Ahead

It must be remembered, and it must be constantly kept in mind, that, although we have an emergency at the present time and immediate action must be taken in a number of cases, we are interested in planning for America's permanent defense. This means that care should be taken to provide improvements which will be of permanent and lasting value as well as those which can be used only in the present emergency. It means also that we must refrain from doing things which will result in permanent disadvantage to any community or the nation.

For example, a report has reached this office of a Western housing development which the planning agency contends is improperly located and will result in permanent damage to the community. The excuse given for the location on the site selected is the present emergency. There can hardly be any justification for locating a large number of residences in an area unsuited for them. The excuse of "present emergency" must not be used as an evasion for sound planning. Our cities, states, and the country as a whole will be here long after the present emergency has passed; rather than serving as a justification for bad planning, it might better be used as a justification for obtaining some of those improvements which are so needed in our American communities but were not available heretofore.

Many important events will take place in the near future. These will involve the well-being of the United States. There will probably be considerable construction, demanding sound and immediate planning advice. Either the planning agencies must be ready or others will be called upon to provide that advice. Planning agencies will probably never have a better opportunity to serve their communities or to justify their existence.

Protecting the Jobs of City Employees Called for National Service

NEW YORK CITY, San Francisco, Milwaukee, Portland, Ore., and Galesburg, Ill., are among the cities taking steps, either through enactment of ordinances or through civil service commission rulings, to protect the jobs of city employees called into military or national defense service, the American Municipal Association reports.

The New York City action was taken by the Municipal Civil Service Commission August 12, while policies of the other cities were established by ordinance, or are under consideration. New York City's civil service policy is as follows:

"Every employee of the city government who is a member of the National Guard, naval militia, Reserve Corps, or Federal military, naval or marine services, is entitled to absent himself while engaged in the performance of ordered duty.

"For the first 30 days of such ordered duty he will receive his city salary and for periods of over 30 days he will receive . . . the difference between his military compensation and his regular city salary.

"Vacation and sick leave accrued prior to the date of service are preserved for the employee called to active duty."

Promotion rights are preserved for persons on military duty, according to the New York City civil service policy, and examinations taken after return from duty will, if passed, place the person on the promotion list in the position he would have attained had he taken the regular test. Also, provisions are made for leaves of absence without pay for emergency service of a non-military character.

In Portland, an ordinance adopted by the City Council July 10 provides that positions left for military, naval, marine, or emergency civil defense employment shall be available to employees and officers of the city upon their return from such military service.

A pending ordinance in Milwaukee provides that a city worker summoned for service in the army, navy or marine corps be granted an indefinite leave of absence; that his seniority, civil service and pension rights remain unimpaired; and that he be restored to his former position at the end of his service unless he is physically disabled. If an employee must resign from city service to accept military service, he would be reinstated when the service has ended.

Galesburg's City Council on August 19 resolved that if any full-time city employees are called for National Guard or compulsory military training, they will find their jobs waiting for them when they return from service—provided the city administration does not change in the meantime.

An ordinance granting 30-day leaves with pay for San Francisco's city employees engaging in voluntary military duty was withheld from final approval recently until plans could be worked out to prevent crippling of the Police and Fire Departments.

New Census Figures

for cities of over 25,000 population are listed on page 85 of this issue.

TIME LIGHTLY TOUCHES
THE FINE QUALITY OF LAYNE

WELLS AND PUMPS

When you buy a Layne Well Water System, you can be assured that it will give you long years of excellent service. In addition to using the very best quality in materials, Layne also provides special types of metal for submerged parts. This infinite attention to details is legion through the Layne organization and has served to build a world-wide reputation for the dependability of Layne Wells and Pumps.

At this time there are many plans being drawn for expansion and much actual building is already under way. Would it not be wise to give extra attention to your water problems? By direct comparison with any equipment on the market, you will find exclusive and outstanding features in Layne wells and pumps. Year by year and dollar by dollar, Layne offers you the best value.

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During September we hope you will remember to mention THE AMERICAN CITY.

Our Municipal Notebook

Future of Municipal Power

IN SOME QUARTERS the municipal electric plant is still looked on as a challenge or a reproof to the power industry. This is a hangover from the times when high electric rates were the reason or incentive for the establishment of publicly owned plants. Rates were then high because (1) the electric industry was in process of vast expansion and (2) "the public be studied and served" had not yet been discovered to be good business.

The period was much like the early railroading period, and it, too, is over. Now the industry is consolidating. Financial structures have been erected, toppled over, and rebuilt with fewer stories and simpler lines. The plants and systems themselves have been re-equipped with modern machinery which makes one pound of fuel produce what formerly required 2½ pounds. Genuine economies have brought about substantial decreases in private power rates.

In many instances the great private system can pay its bondholders, stockholders and officers and still meet the rates charged by municipally owned systems. High private rates have ceased to be the principal incentive for establishing city-owned power plants. Yet city-owned plants are being built and enlarged at as high a rate as ever. Indeed the greatest period of expansion has been during the last fifteen years. And now with growing recognition that the bombing of the generating centers of great electric power systems is not entirely outside the bounds of possibility, it will also be recognized that a municipal electric plant in as many cities as possible would be the best assurance of keeping the home lights burning in case of such an emergency.

Municipal plants produced 2,302,000,000 kwh in 1925; 3,603,000,000 in 1930; 4,228,000,000 in 1935; and 5,688,000,000 kwh in 1939. This is an expansion of 147 per cent, compared with 96 per cent for the privately owned electric utilities.

The installed capacity of municipal plants increased 75 per cent since 1930, while private capacity increased 13 per cent. What is the outlook for the future? The Federal Power Commission has just reported scheduled additions to be made to generating plants in 1940 amounting to 545,200 kw for publicly (not necessarily municipally) owned plants, and 1,322,625 kw for privately owned plants. Scheduled beyond 1940 is equipment of 758,000 kw capacity for publicly owned plants, and 1,653,000 kw for privately owned plants. Diesel engines are scheduled for municipal plants in 20 states this year.

If rates are no longer the paramount issue, what is the reason for the steady growth in municipal electric power capacity and production? Possibly the ready availability of Federal money induced a number of towns to build electric plants. On the other hand, even these towns must in most instances already have decided to build plants. Such decisions usually require quite a build-up of local public opinion; and after the public is willing, years frequently pass before the legal obstacles are cleared.

The fact is that a municipal plant built without politics and run without politics is a valuable asset to a community. Whether it provides free power for municipal buildings and street lighting, or charges about the private rates prevailing in the vicinity, there is usually a fat surplus available for town improvements or tax reduction. Wherever desired, the revenue soon pays for the plant, and thereafter the surplus depends on the rates. A number of towns have no city tax, and a number of other towns have a lower city tax, because of the municipal plant.

Cut Out the Paternalism

The future of municipal power appears to depend on the degree of common sense and rationality with which it is viewed. As a mere attack on the private power industry it will fail because demagoguery is never permanently constructive, and disappears with the passing of the demagogue.

What About Fire Insurance?

WHEN THE MAKERS of the products of an industry show genuine interest in the problems of their customers, those problems are on the way toward constructive solution.

Fire insurance is said to cost too much. The white light is now turned on insurance of municipal properties. The report of the American Municipal Association shows that a group of municipalities in nine states pay $2,500,000 in premiums and receive $350,000 in losses. Does this mean spending $1 to get 13 cents value?

What shall the fire insurance companies do when confronted by these figures? How shall they show that at any moment many cities may be receiving the dollar and the insurance companies left with the 13 cents? Some of the companies recognize that, despite the convenient agent buffer system, insurers are ultimately the customers of the companies. One company, for instance, on being informed of the situation, immediately placed its engineering staff at the disposal of the city governments.

Progressive and energetic insurance executives have an outstanding opportunity to enlighten mayors, councilmen, commissioners, city managers and municipal department heads on the entire subject of insurance.

Local Re-creation

RE-CREATION is what this nation and all of us need, and the best way to assure that the most people have it is to provide a place where it is directly and specifically available. An excellent example of such a place is Longbrook Park, being developed by the town of Stratford, Conn. Started in 1932 by the Town Manager Donald S. Sammis, now Works Manager of Underwood Elliott Fisher Co., and carried through by present Town Manager William H. Shea, it consists of 22 acres of baseball, softball and football fields with bleachers for 4,000, wading pool, skating pond, and woodlands.

It is seen that Longbrook Park possesses essential attractions. The fields are level and well kept. There is a house of fieldstone construction for the convenience of athletic teams, maintained in condition by a concessionaire. Stratford also has winter sports.

COURTESY OF MURDOCK MFG. & SUPPLY CO.

Plenty of drinking water for hundreds or thousands of citizen athletes, and seats for their admiring old folks and children in arms

WINSTON-SALEM *Improves Pressure with* THREE NEW ELEVATED TANKS

1. ABOVE: 50,000-gal. Horton ellipsoidal-bottom tank installed in the southern section of Winston-Salem.

• • •

2. CENTER: 88-ft. diam., radial-cone bottom tank, centrally located. It has a capacity of 1,000,000-gals.

• • •

3. LEFT, BELOW: 200,000-gal., radial-cone bottom elevated water tank with 16½-ft. range, located in a northern section of the city.

WINSTON-SALEM, N. C. is making sure that its waterworks system will serve consumers well for years to come. With the completion of recent improvements, which included the three Horton elevated water tanks shown here, residents of this historic Southern city now enjoy all the benefits available with efficient, up-to-date water supply facilities.

The water system at Winston-Salem serves 95,000 people. Water requirements vary from 6 to 12 m.g.d., and pumping pressures range from 115 to 135 lbs. per sq. in. The purpose of the recent improvements was to replace old standpipes which had become inadequate, and to provide sufficient storage to regulate the pressure in the system, equalize the difference between the demand and supply and eliminate the necessity of operating additional pumps during peak demand periods. This particular situation serves as an example of how elevated storage helps to solve water supply problems. Let us discuss your storage requirements with you, without obligation. Please address our nearest office.

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Chicago	2127 McCormick Bldg.	Philadelphia	1616-1700 Walnut St.	San Francisco	1033 Rialto Bldg.
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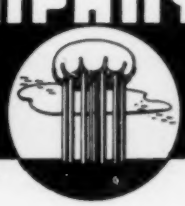
Cleveland	2236 Rockefeller Bldg.	Birmingham	1502 N. Fiftieth Street	Tulsa	1625 Hunt Bldg.
Detroit	1501 Lafayette Bldg.	Dallas	1606 Praetorian Bldg.	Los Angeles	1403 Wm. Fox Bldg.



Plants at BIRMINGHAM, CHICAGO, and GREENVILLE, PA. *In Canada:* HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

When you write for that catalog, kindly mention THE AMERICAN CITY.

Water-Works Operation

Important Dates in the Water-Works Field

IF AT SOME FUTURE DATE water, gas and sewerage operators and engineers might sit around a large conference table to compile a chronological list of the dates of important developments in their respective fields, it is highly probable that December, 1939, would be included. This date marks the formal approval by the American Standards Association of specifications for cast iron pipe, more particularly designated as:

A21.1-1939—American Recommended Practice—Manual for the Computation of Strength and Thickness of Cast Iron Pipe.

A21.2-1939—American Standard Specifications for Cast Iron Pit Cast Pipe for Water or Other Liquids.

A21.4-1939—American Standard Specifications for Cement Mortar Lining for Cast Iron Pipe and Fittings.

These are the first specifications to be established as A.S.A. Standards which have resulted from thirteen years of tireless efforts of the Sectional Committee (A21) on Specifications for Cast Iron Pipe and Fittings. It was not as simple as arranging a few meetings after which a harmonious agreement was reached. There had been a growing realization among designing engineers, users and cast iron pipe manufacturers that a new theory of design should be developed in which not only static water pressure and water hammer but also earth pressure, load from trucks and different methods of laying are included in computations for thickness.

A comprehensive outline of tests to be made in connection with these new specifications was drawn up by T. H. Wiggin, Chairman, Sectional Committee (A21). Of primary importance was the experimental investigation of the effects of combined internal pressure and trench loads on cast iron pipe. In addition, bursting, impact and other tests were carried out to determine various qualities of the pipe.

The results of these exhaustive tests showed that the relationship of trench load to internal pressures could be expressed by a parabolic curve, inspection of which readily shows that trench loading is an important factor—in some cases the major factor—in setting up stresses in the pipe. Laying conditions are also important and bear a definite relationship to the trench load.

As a result of these findings, the new specifications are made up on a triple basis, having three variables—internal pressure, depth of trench and laying condition. Tables in the specifications make it readily possible to find the proper pit cast pipe thickness for pressure ranges of 50 to 350 pounds, trench depths of 3½ to 8 feet and four laying conditions. Furthermore, a wider range of trench depths and laying conditions can be found in the aforementioned Manual.

With these carefully prepared specifications available, consulting engineers and pipe users can readily determine the thickness or thicknesses of pipe that will meet their known requirements. In some cases the pipe might be lighter and other cases heavier than previously used. However, it is sound economically to use the lightest-weight pipe that is consistent with recognized engineering practice.

—From an editorial in *The U. S. Piper*, published by The United States Pipe and Foundry Co., Burlington, N. J.

A Remarkable Record in Bill Collection

THE ANNUAL REPORT of the town of Winchester, Mass., for the year ending December 31, 1939, contains two remarkable sentences on page 4, as follows: "We closed the year with only two unpaid water bills. These amounted to $3.50 and were dated December 11."

How many other water departments can offer a record to equal this one? There are 3,415 water customers in Winchester, which has an estimated December 31, 1939, population of 13,850. There are only 13 houses in the town not connected to the public water supply.

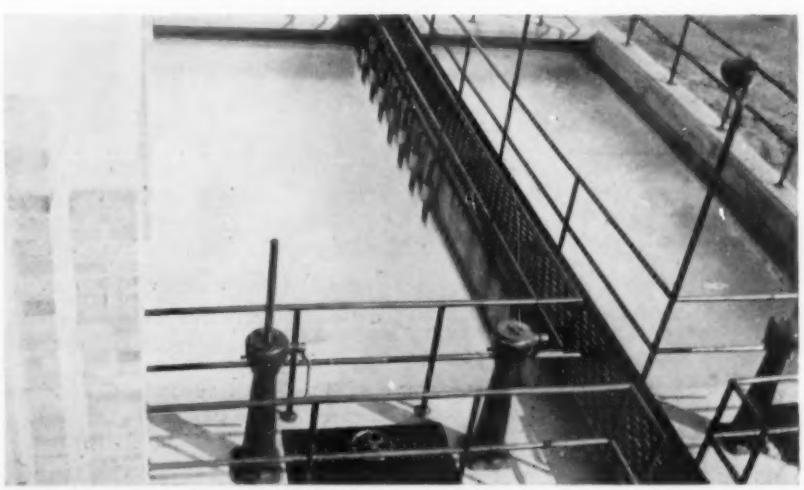
Constant Improvements to Maintain Service

A TOTAL OF ABOUT $680,000 was spent by the Hackensack Water Co., Weehawken, N. J., for additions and replacements during the past year in order to maintain its widespread water service. More than 15 miles of main were added to the system, which supplies 53 communities in Bergen and North Hudson Counties, as compared with about 12 miles in the previous year. Low-priced housing developments were largely responsible for a marked increase in the number of service connections and water meters installed.

Service connections for new houses totaled 1,465 in 1939, as contrasted with 854 in 1938. Service connections installed opposite vacant property in advance of improvement of streets numbered 468, as against 249 in the preceding twelve months. The number of old service connections replaced was 1,186, as compared with 1,150. A total of 3,119 service connections was added during 1939, as compared with 2,253 in 1938.

Fire hydrants, new and replaced, aggregated 322 as against 231. The increase in the number of meters in service was 1,774. In 1938 the gain was 1,000. Meters in service at the end of 1939 reached a total of 77,089; in 1938 the number was 75,315.

Properties retired from service, amounting to about $100,000, comprised mains, services, hydrants, meters, automobiles, equipment, and other ordinary items.



Looking Down from the Second Floor of the Chemical Building Toward the Carbonation Basins at the Hamilton, Ohio, Water-Softening Plant. *See* THE AMERICAN CITY, *May, 1940, Page 44*

To stop this *WASTE*—

we've developed a truly modern truck tire that puts more rubber where you need it on 1940 roads—

The New Hi-Miler

IF you operate a truck in general highway service, you'll check on this:

When tires wear bald there's a lot of unused rubber left around the shoulders—wasted rubber you paid for that didn't pay you back!

That's because today's flat, smooth, wide-curved roads don't give tire shoulders much work—the wear's all in the tread center.

And as usual Goodyear leads with the answer. After months of research and testing we're ready with an entirely new type of truck tire designed for modern highways—a tire so standout in long-distance performance it is justly called the HI-MILER.

In the new HI-MILER we get this mileage step-up by slimming down the shoulders and putting more rubber in the load-carrying tread center. This gives us a 12% to 15% thicker tread—*the deepest non-skid tread ever built on a general purpose tire* — without any increase in weight.

Because it puts more usable tread rubber under the load, the HI-MILER delivers mileage comparable to premium-priced tires. Yet you pay no premium for it.

This great new long-distance carrier is made with two types of tread: Full Rib and All-Weather to meet your traction needs. Why be satisfied with conventional tires, when these modern premium-mileage HI-MILERS cost no more? Get them at your Goodyear dealer's—specify them on new trucks.

HERE'S WHAT YOU GET IN STEPPED-UP PERFORMANCE

Longer mileage from 12% to 15% thicker tread center

More efficient wear because of higher percentage of rubber in load-carrying area

Plus these time-proved Goodyear advantages

Greater protection from heat and fatigue due to use of lighter, stronger, low stretch Supertwist cord

Greater adherence between tread and carcass due to new stronger "multiple compound" bonding

Highest resistance to cutting, chipping and cracking from use of toughest tread compound

Made in two types
..for all general on-highway service
HI-MILER ALL-WEATHER center traction tread
HI-MILER FULL RIB smooth-rolling tread

Hi-Miler, All-Weather, Supertwist—T. M.'s The Goodyear Tire & Rubber Company

THE GREATEST NAME IN RUBBER

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Sewage Treatment and Storm Water

Sewage Clarification by Pre-Flocculation

A PAPER SHOWING how sewage clarification can be improved by pre-flocculation without the use of chemicals was presented at the annual meeting of the New York State Works Association last January by A. J. Fischer and A. Hillman, of the Dorr Co. The paper presents laboratory and plant data, with particular emphasis on the advantages of this method in the primary treatment of sewage. The general conclusions drawn from the work which has been done are as follows:

1. Laboratory tests show that pre-flocculation increases the rate of settling and removal of suspended solids from raw sewage, trickling filter effluent and aeration tank (activated sludge) effluent.

2. Plant tests on raw sewage at Cedar Rapids, Iowa, with constant flows, and at Ypsilanti, Mich., with variable flows, demonstrated that improvements as indicated by laboratory tests may be obtained in actual practice.

3. Plant results on trickling filter effluent at Sioux Falls, Iowa, with constant flows were also in general agreement with laboratory tests.

4. Pre-flocculation may be used to advantage in sewage clarification for either increasing the removal of suspended solids or increasing clarifier capacity, or both.

5. The suspended solids test is of questionable value in determining the true efficiency of a settling tank, owing to possible change in the samples during storage and because the test does not take into consideration flocculatable and non-settleable solids.

6. A more exact method of measuring the efficiency of a clarifier is to take the ratio of the plant removals to laboratory removals under fixed quiescent conditions. This method might be used in comparing sedimentation units at different plants.

7. An average design flow, minimum flocculator detention of 30 to 40 minutes, and clarifier detentions of 1.5 to 2.0 hours with a maximum overflow rate of 800 gallons per square foot per 24 hours, are recommended for raw sewage flocculation.

8. For trickling filter effluent treatment, 30 minutes flocculation and 1.0 hour settling at 1,000-gallon per square foot per 24 hours overflow rate, should be satisfactory.

9. More consideration should be given to area and overflow rates than to detentions in the design of settling tanks where flocculation is employed.

10. Owing to the fragile nature of some of the flocs produced by pre-flocculation, the inlet and outlet disturbances should be held to a minimum, and velocities in and after the flocculator should not be allowed to exceed about 1.5 feet per second.

11. In general, pre-flocculation is economically justified in the treatment of raw sewage or trickling filter effluent ahead of settling. Its use in the case of activated sludge settling is questionable where good settling conditions prevail.

12. An indication of the popularity of pre-flocculation is its extensive use during the past three years. Its more general application with either separate flocculators and clarifiers or combination type units is predicted.

Attend the First Annual Convention of the Federation of Sewage Works Associations, Chicago, Ill., October 3-5.

Storm-Sewer Pumps at Schenectady, N. Y.

ON MARCH 31, 1940, the Cowhorn Creek storm-sewer pumping station in Schenectady went into operation for the first time since it was completed, in September, 1939. The station was designed by E. G. Liberty, Assistant Engineer of Sewers with General Electric Co. engineers cooperating in the design of electrical equipment and all under the supervision of L. C. Purdy, City Engineer, to provide flood protection for the city's drainage system against flood stages in the Mohawk River. In its first test, the new station was entirely successful, the first time that flooding in all tributary areas was prevented.

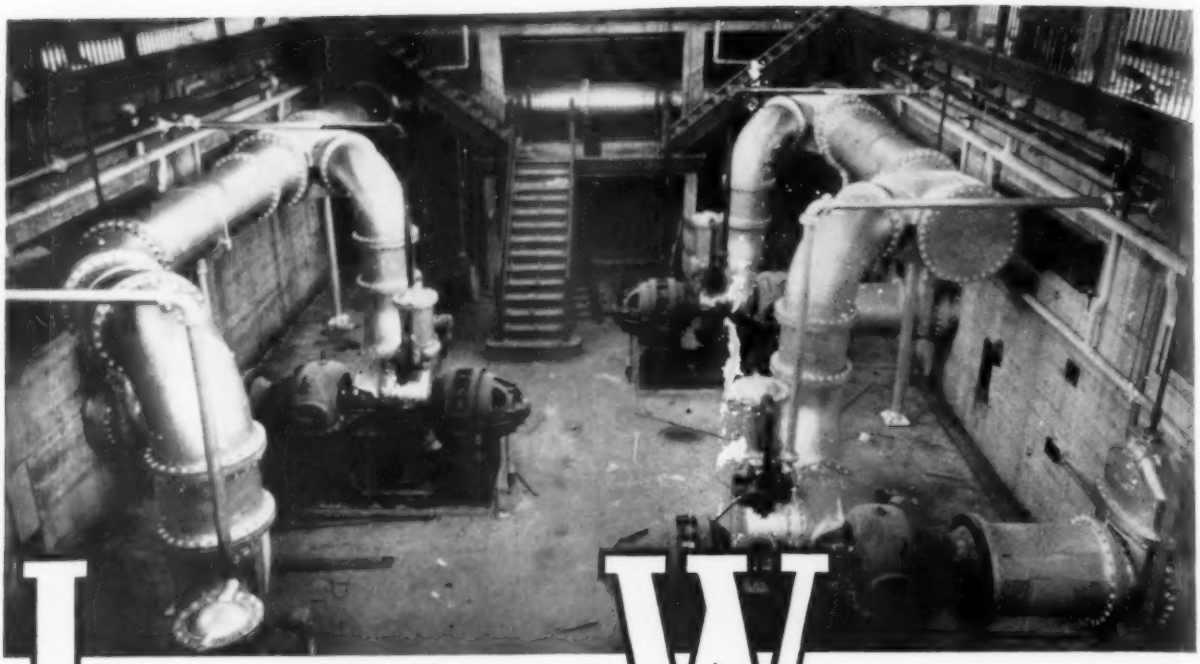
The drainage from three creeks with a total dry-weather flow of about 50 cfs is brought into the Cowhorn Creek pumping station, and under normal conditions flows by gravity into the nearby Mohawk River through two 60-inch backwater gates in the station. Under flood conditions, with possible increased flows in the creeks, the drainage is pumped into the Mohawk.

Three 45,000-gpm Worthington pumps driven by G.E. motors operate against a 19-foot head, although the average operating head is about 10 feet and consequently the pump capacity is considerably higher.

These vertical synchronous type motors rated at 300 hp, 277 rpm, 3-phase, 60-cycle, 4,000-volt, are of streamline design with air-cooled thrust bearings on top of the motors, and with the flow of the cooling air down through the motors into the pump pit.

Since the station is operated for a period of only two to three days during the year, and since no heat is provided in the building, condensation could present a serious problem. It was therefore necessary to provide heat in the motors and control equipment and to use special armored parkway cable in place of the usual lead-covered cable and conduit for the high-tension service from the transformers to the motors and their control cabinets.

The Three Synchronous Motor-Driven Pumps in the Cowhorn Creek Storm-Sewer Pumping Station, Schenectady, N. Y.; Showing Also the Three Nash Vacuum Pumps in Foreground for Priming



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Garbage Collection and Disposal

Trichinosis Commission Created in New York

THE FIRST STATE TRICHINOSIS COMMISSION to be established in this country started work in New York in June, 1940, to blaze the trail for a nation-wide preventive campaign against the pork disease. The Commission was created by the 1940 New York State Legislature through a bill introduced by State Senator Thomas C. Desmond, of Newburgh, N. Y. As our readers know, trichinosis is a muscle disease contracted by eating undercooked infected pork. (See THE AMERICAN CITY, May, 1940, p. 11.)

"One of the important duties of the Commission," says Senator Desmond, "will be to study the desirability of state legislation to prevent feeding undercooked pork scraps to hogs. A survey of 763 American cities of 10,000 population or more in 1939 revealed that 397 cities, or 52.0 per cent, disposed of municipal garbage in whole or in part by feeding it to swine.*

"The New York Commission will also investigate methods to prevent hogs from becoming infected with the trichina parasite, according to a recently developed serum test, microscopic inspection of hogs, state meat inspection, and refrigeration of slaughtered swine.

"States throughout the country have indicated their deep interest in the creation of the New York State Trichinosis Commission, and it is expected that recommendations made by the Commission will be adopted not only in New York State but in other states as well."

* Preliminary report on municipal garbage disposal methods presented by WILLARD H. WRIGHT, Acting Chief, Division of Zoology, National Institute of Health, U. S. Public Health Service, presented at the Conference of State and Territorial Health Offices, Washington, D. C., April 24, 1939.

Low Complaint Record on Refuse Collection

A RECORD WHICH MERITS HONORABLE MENTION was made by the municipal refuse collectors of Palo Alto, Calif., in 1939. They made 360,464 collections with only 71 complaints. Municipal refuse collection was started in 1914 and has resulted in greatly enhancing Palo Alto's reputation as a clean city.

The previous low mark for garbage complaints was in 1936, when 109 were recorded. Palo Alto requires at least one garbage collection per week from each occupied premises. Two, three or six collections per week may be had if desired. The complaint ratio for 1939 was one complaint for every 5,077 calls.

—From the 1939 Annual Report of the Health Department of Palo Alto, Calif.

Household Separation Aids Garbage Disposal

TWO IMPORTANT FACTORS in the successful and economical operation of a municipal garbage-disposal system include (1) methods of disposal adopted by the city, and (2) citizen cooperation in making certain separations at the home before garbage and other refuse are collected by the city. "The degree to which the individual citizen follows separation regulations will be reflected throughout disposal operations, and will contribute directly to the success or failure in the administration of this public service," comments the American Public Works Association in a recent report.

Requirements governing the separation of garbage and other refuse are based not only on the method of disposal, but in many instances on practical uses to which refuse is put. If a city uses the hog-feeding method for disposal, the garbage must be separated from other classes of refuse. This applies also to paper in which garbage is wrapped, which is not usually permitted where hog-feeding is practiced.

A number of cities, including Philadelphia, Indianapolis, Washington, D. C., and Rochester, N. Y., dispose of garbage by the reduction process. This results in the extraction of grease, which usually is sold to soap companies. What is left is sold as fertilizer. If this process is used, the householder must keep his garbage separate from tin cans, bottles, broken glassware, ashes and other classes of refuse. The same separation requirement also applies in cities where garbage is ground for fertilizer.

If a city uses incineration as a method of disposal, it may require citizens to cooperate by separating refuse into combustibles and non-combustibles. The collector then can collect for incineration garbage and combustibles from one set of containers, while ashes and non-combustible rubbish may be disposed of by dumping. Other methods of disposal include open burning, open dumping and the sanitary fill method, all of which may require special separations by the householder. The individual efforts of the householder, while they may take a few minutes a day, prevent additional costs to a city and greatly facilitate disposal.

A. P. W. A.
Book-Cadillac Hotel
Detroit, Mich.,
Sept. 30-Oct. 2

The charging floor at the new municipal incinerator at Pittsburgh, Pa., showing the two 2-yard Blaw-Knox hard-digging lever arm charging buckets. This type could be used because of the headroom available at the plant

Where a "penny wise" policy caused the loss of this

$250,000 School

A Six Hundred Dollar Investment Might Have Saved This

THE officials of a certain town in Maine turned down the suggestion to install an automatic alarm system connected with the fire department circuits as too exorbitant. The cost would have been only $600.

This fire was first noted by a citizen who ran past six alarm boxes to the fire station causing another of those DELAYED ALARMS. When the firemen did arrive the interior of the school was a mass of flames and the roof had caved in.

No community can have too many conspicuously and accessibly placed fire alarm boxes. This precaution will save precious minutes and cut down fire losses appreciably.

Check up on conditions in your locality—recommend that automatic alarm systems be installed in all schools and important buildings. Gamewell engineers will advise you.

GAMEWELL VITAGUARD

For volunteer fire departments

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Write for interesting examples of what VITAGUARD has accomplished for many towns supporting volunteer departments.

THE GAMEWELL COMPANY

NEWTON UPPER FALLS MASSACHUSETTS

Public Safety

Illuminated Traffic Lines and Markers

THE TWO MOST IMPORTANT TRAFFIC-SAFETY DEVICES are undoubtedly traffic signals in cities and the center line on highways. A new device has been developed for possible use with traffic signals, and to be an illuminated center or guide line at night. This device is a neon-tube unit encased in a steel box which is watertight, its top or face consisting of transparent plastic or toughened glass.

Five of these lights were installed along the center line of Broadway, Little Rock, Ark., on March 22, 1940. They are located 50 feet apart and during the last four months have remained reasonably clean and have evoked widespread interest as well as given local satisfaction. This street consists of a 7-inch concrete base overlaid with a 3-inch layer of asphalt. The photograph shows the units and the location of the lead-covered conductor which runs alongside them under the asphalt. There is also a STOP light embedded in the pavement. The cost of these six lights operating 14 hours per day is said to be 60 cents per month. When an electric line is not available, the lights can be operated by dry cells.

The Little Rock installation, besides establishing the practicability of a center-line light flush with the pavement, is testing the durability of four types of plastics: Montsanto Cast Phenolic, of the Montsanto Chemical Co.; Plexiglas, of Röhm & Hass Co.; Lucite, of E. I. du Pont de Nemours Co.; Bakelite, of the Bakelite Corporation.

The Arkansas State Highway Department plans to install a mile of these center-line lights spaced 200 feet apart on the straightaway and 25 feet on curves. At the new Washington, D. C., National Airport, two large runway signals—a cross in red indicating that the runway *must* be used, and a 90-foot arrow in green indicating that it *may* be used—will be furnished by Illuminated Guide Line, Inc., Little Rock, Inc.

One of the most interesting applications of these lights may be at intersections in combination with the traffic signals, showing the same color as the signals.

Corner—or Suspended—Traffic Signals?

THE MAJORITY OF TRAFFIC ENGINEERS favor the installation of traffic signals on the far right-hand corners of an intersection, and I do also. On the other hand, I am acquainted with some very able traffic engineers who favor the center suspension type.

Ten years ago most of us were predicting that the day of the overhead suspension signal, especially in large cities was just about over, but when a city like Cleveland, Ohio, which most certainly has a capable traffic engineer, installs suspension signals, as is being done at present, then we can be sure that the suspension signal is going to remain with us for a good while.

If I were the traffic authority of a small town and had sufficient funds at my disposal to cover the installation of two-way three-color vertical post top traffic signals, one at each of the four corners of an intersection, I should employ that type of installation. If my funds were limited, I should install a 4-way 3-color suspension signal over the center of the intersection.

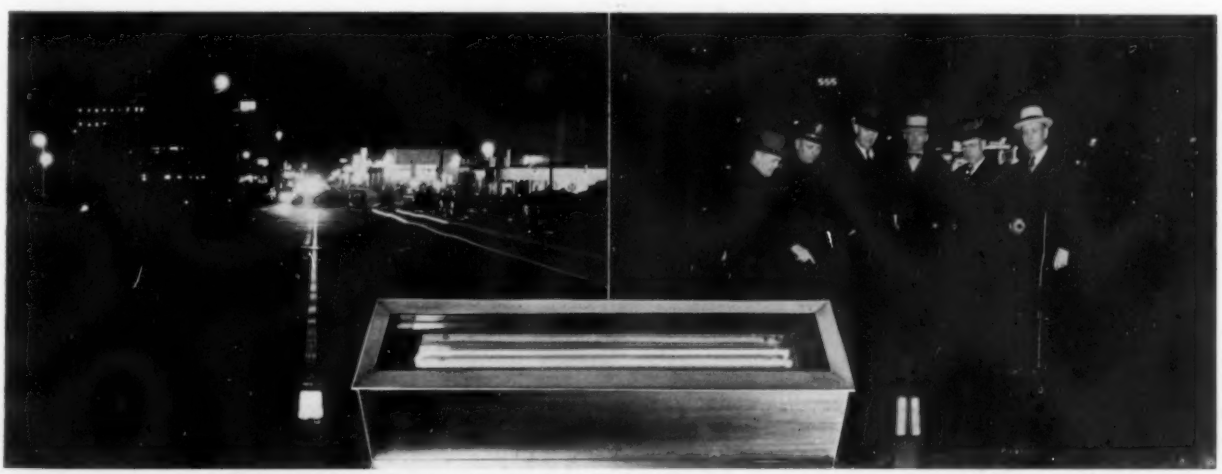
One thing that has always caused me to prefer the two-way three-color post top signal at each of the four corners of an intersection is that with such an installation it is possible for an approaching driver to see a signal face at the far right-hand corner of the intersection as he approaches, and also at the far left-hand corner, and if a light bulb has burned out in either signal face, the driver can still determine what he should do to comply with the signal through observing the signal indication on the other face.

H. I. TURNER,
President and General Manager, Eagle Signal Corporation, Moline, Ill.

Is Yours a Safe City?

A COMMUNITY lacking modern highway and street facilities or illumination, having no facilities where children may play in safety, or adequate protection for shoppers and other pedestrians, is an unsafe community. It does not seem impracticable to predict that as cities now lacking adequate safety services realize their cultural and social disadvantages, there will be strong demand for such service as essential protection.

RAY MURPHY,
Association of Casualty and Surety Executives, New York, N. Y.



At left, neon units 50 feet apart on Broadway in Little Rock, Ark.; lower center, a 30 x 6-inch neon unit with transparent face; at right, in usual order, John H. Greene, inventor of illuminated guide line; Lieutenant W. G. Staub, Traffic Commissioner, city of Little Rock; R. E. Ritchie, President, Chamber of Commerce, and Assistant to President of Arkansas Power & Light Co.; W. W. Zass, Chief Engineer, Arkansas State Highway Department; W. T. Field, President, Arkansas Engineers Club; Lester E. Newland, City Electrician

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30 Church Street New York, N. Y.

Vol. LV, No. 9 The American City September, 1940

Automatic Control of Treatment for Well Water

Aeration, Coke Contact Beds, Filtration at Small Plant Serving Norwood, Mass.—Costs and Operating Methods

By Bayard F. Snow
Consulting Engineer,
Boston, Mass.

ABOUT fifteen miles south of Boston on U. S. Route 1, the town of Norwood maintains its Ellis water-treatment plant. The plant was built in 1936 and put into operation in January, 1937. Since that time the plant has been treating about half the water used by the town of 15,500 people. The source of the water is the Ellis well field, which has 132 2½-inch tubular wells, 25 to 60 feet in depth. The other half of Norwood's supply is of surface water from Buckmaster Pond in the adjoining town of Westwood.

Difficulties Encountered

For many years before 1935, Norwood had been having trouble with the quality of its water. The trouble consisted of "red water," poor taste, odor and corrosion. The State Department of Public Health made an investigation in the spring of 1935 and concluded that the high iron content and low pH were responsible for the unsatisfactory condition of the water. The Department then recommended that the town engage engineers to design and construct an iron-removal plant to treat this water.

Entrance to the Ellis Water-Treatment Plant of Norwood, Mass.

X. Henry Goodnough, Inc., was engaged to make a separate investigation of the water supply and distribution system and report to the town on means of eliminating the red water trouble. It was found that the distribution system was heavily laden with iron deposits and was, to some extent, acting as a treatment plant. This was borne out by the fact that, although analyses of the raw water showed a high iron content, there were relatively few complaints from the consumers. It was noted, however, that the brass plumbing in the domestic services was being attacked and that the tanneries were complaining about the spotting of the hides by the water.

Aeration Basins in Front of the Norwood Water-Treatment Plant

The Syntron Feeder for Dry Lime

The engineers' report concluded, therefore, that with the continued increase of the deposits in the distribution system, the frequency and intensity of the resulting troubles would increase together with the necessity, cost, and difficulty of removing the deposits and growths from the system. Treatment of the water supply from the Ellis well field was recommended, and design and construction went ahead with the aid of a PWA grant.

New Treatment Plant

The treatment plant is designed for a capacity of 2 mgd, to remove iron and manganese and correct the corrosiveness of the water. In order of operation, the following equipment is provided: two low-lift 2 mgd centrifugal pumps, each driven by a 25-hp induction motor; two 18 x 40-foot aeration basins with ten full-cone Sprayco nozzles; two upward-flow contact beds in series, one 15 x 30 feet with 4 feet of coke, the other 18 x 40 feet with 4 feet of coke; a mixing chamber where lime may be added when necessary to correct the corrosiveness of the water; a settling basin allowing a detention period of one hour and thirty-three minutes; a sand filter of two units, with a total sand area of 8,708 square feet, a sand depth of 3 feet and operating at a rate of 10 mgd. The clear-water basin has a capacity of 256,000 gallons and water is pumped from it into the distribution system by a two-stage Goulds high-lift centrifugal pump with a 125-hp General Electric synchronous motor.

Automatic Operation

One of the attractive features is that automatic operation governs everything in the plant with the exception of the high-lift pump. One operator provides all the labor for normal operation of the plant except when the coke beds or filters must be cleaned. In addition to automatic operation, the controls are arranged so that any part of the plant may be neatly bypassed. As part of the automatic control arrangement, there is a float switch in the clear-water basin which shuts off the power to all equipment entering into the treatment process when the clear-water basin is full. This switch also closes a hydraulic valve on the inlet to the clear-water basin, preventing further increase in the level in the basin and the drawing-off of other parts of the plant. The rate of flow through the plant is set and controlled by rate controllers, installed at the outlet of each filter, which maintain a constant rate of flow through them. Loss-of-head gages connected to the outlet of each filter are located in the lobby next to the office. These show the hydraulic loss through the filters and indicate when it is necessary to clean them. A water-level recorder is provided in the clear-water basin, which shows the depth of water available in storage for quick draft in the event of emergencies and gives a history of operation.

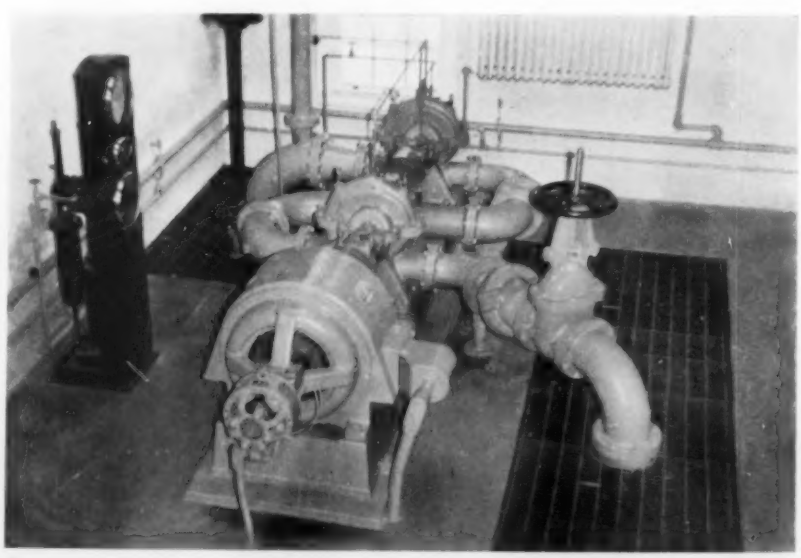
Attractive Setting of Plant

The building itself is an attractive addition to the town's property. The grounds surrounding the building have been graded and planted to add to the setting in an artistic and pleasing manner. The exposed exterior concrete walls were finished by brushing as soon as practicable after stripping the forms, the aggregate having been carefully selected to give an attractive appearance. The exposed interior concrete walls were rubbed down with a cork float and white cement. The floor was finished dark-red with a prepared color and hardener mixed with the top course.

The exterior of the superstructure is of waterstruck brick, laid in Flemish bond, and selected for the range of color desired. A light buff-colored brick was used on the interior. Mottled green and purple slate on pine planking over the steel trusses forms the hipped roof of the central part of the superstructure. Granite steps and buttresses, limestone coping, and the architectural treatment of the building, all contribute to the neat and pleasant appearance of the entire plant.

Operation

The plant was put into part-time operation in January, 1937, and has continued in this service,



Master Meter and Pair of Goulds High-Lift Pumps Driven by a Single 125-hp Synchronous Motor

supplying only a part of the water used by the town. The load on the plant has been light for two reasons. Recommended additions to the well field have not been made, so the total load has been light. Recommended eliminations of certain wells have reduced the iron content in the raw water. Despite the improvement in quality of the raw water, as shown by analysis of periodic samples, the plant has done good work as a pumping station and treatment plant.

Within a month from the start of operation, spots appeared on the coke which adhered strongly and grew as time went on. In the later part of the summer, with an increase in the amount of iron in the raw water, their formation and growth became very rapid in both contact beds. By the latter part of November, the accumulation of these flocculent particles began to interfere with the flow through the contact beds and caused a considerable increase in the loss of head through them. At this time the designing engineers were asked to assist in cleaning the plant and remedying this condition.

The process of cleaning the beds consisted of draining through valves provided for the purpose, and washing the coke with a stream from a fire hose, the accumulated deposits being flushed out through the drain. This method has proved very effective, not only in removing the surface deposits but also in cleaning the underlying coke. While it was effective in the removal of heavy deposits, good results have since been obtained by a simple flushing every three or four weeks. It has been found that such cleanings removed practically all the iron deposits.

There is no accurate way of determining the volume of iron deposits removed from the coke beds, but at the first cleaning they were estimated to be equivalent to ¾-inch in depth over the entire area of the beds, or a volume of approximately 60 cubic feet. An analysis of the dry material showed:

Volatile matter	18.9 per cent
Organic matter	0.3 " "
Iron oxide (as Fe_2O_3)	39.0 " "
Manganese oxide (as MnO_2)	1.7 " "
Silica and silicates	40.5 " "

In addition to the material removed from the contact beds, a considerable accumulation of iron sludge was flushed from the settling basins. The filters were also cleaned, the total materials removed in the various cleaning processes indicating that iron was passing through the plant.

The CO_2 in the raw water varied from 16 to 20 ppm, and was reduced to an average of 7.5 ppm after aeration, thus reducing its corrosive action. In operating the aerator in very windy weather, part of the flow is bypassed directly to the coke beds. Provision is made for automatic draining of the aerator piping in order to prevent freezing when the plant is shut down over night in winter.

The mechanical equipment of the plant has functioned well in spite of large amounts of air coming in with the raw water from the old tubular wells. The automatic controls and protective devices have permitted the plant to operate with a minimum of attention. One operator has been in attendance on each shift of operation and twelve man-days were required for cleaning the plant after operation the first year. The filter beds have been cleaned once a year. The town has used an average of 402,312,666 gallons of water a year, 204,970,000 of which was pumped at the Ellis treatment plant, with a consumption of 323,300 kwh per year. Other costs amount to $3 for each cleaning of the coke beds, and $35 for cleaning the filters, or an average yearly labor operating cost of $3,288.

The filter equipment was installed by Norwood Engineering Co., of Florence, Mass.

"Soaking" the Big Cities

THAT cities of metropolitan size receive, as a rule, less financial aid proportionately from the state and spend a greater per cent of their local taxes for highways than other cities and towns in the metropolitan district, is a matter of general belief. Definite figures to reinforce this belief in the case of Boston were presented last month in a WPA report released by the Massachusetts State Planning Board.

This "Survey of Boston Metropolitan District and Adjacent Areas" covers population trends, assessed values, highway expenditures, traffic flow, and the use of recreational centers. It was sponsored by the State Planning Board with the Metropolitan District Commission and the Boston City Planning Board as co-sponsors. As summarized by Miss Elisabeth M. Herlihy, Chairman of the State Planning Board, outstanding facts revealed by the WPA study include:

Highway Expenditures.—Until the year 1932 a negligible amount of state funds was spent in Boston on highways, with the exception of the old Colony Boulevard. Since that year Boston has received from 8 to 10 per cent of the state highway funds marked for the 149 cities and towns within 30 miles of the State House. State and metropolitan highway funds have been used to construct highways and arteries leading into Boston, but Boston has supported almost entirely the cost of continuing these arteries within its limits. Local expenditures for highways have been about the same on a per capita basis in all the 149 cities and towns.

Traffic Flow.—About 90 per cent of the traffic in Boston is developed by the Metropolitan District and the other cities and towns within the 30-mile radius. That means that only about 10 per cent of the volume entering and leaving Boston is long-distance traffic. This indicates that the important element of traffic using highways within the 30-mile radius—which produces the gas tax funds to build these highways—is of relatively local origin. This is the traffic that struggles in and out of Boston and that needs relief.

Use of Recreation Resorts.—The Metropolitan District Commission administers several well-known recreation resorts for its 43 member cities and towns. Boston's share in this cost is about 45 per cent. On the basis of a survey of the use of these resorts, the WPA report shows that Boston pays substantially more than its proportion, while the rest of the district pays slightly less. Some adjustment of the support for these resorts is suggested by the facts given in the report which can assist in determining a basis for some such readjustment if it is found desirable. Beyond the 30-mile radius, state interest in the use of these resorts is probably less than 10 per cent.

Population Trends.—A compilation of Federal and state census statistics up to 1935 indicates a tendency toward decentralization out of Boston into the inner metropolitan ring of suburbs. Likewise, the population on the rural fringe of the 30-mile radius has tended to move toward this inner-metropolitan ring.

Assessed Values.—The 43 cities and towns of the Metropolitan District hold 77 per cent of the total assessed values of the 149 communities in the 30-mile radius, but the valuation of the Metropolitan District has not increased in proportion to the population in spite of the growth in the value of Boston's downtown business area.

Municipal Garage

Street Department of Medford, Mass., Has Well-Equipped 37-Door Brick Garage and Office Building

By THEODORE REED KENDALL
Engineering Editor,
THE AMERICAN CITY

AN attractive quadrangular building with a paved interior courtyard, and with ample facilities for storing and repairing the entire equipment of the city's Street Department, is located on the Mystic Valley Parkway, Mass. Route 16, near the heart of Medford, Mass. The brick building, with its well-kept lawn and a cannon from the Frigate Constitution, has attracted the attention of hundreds of thousands of motorists who have passed the site each year since the building was erected, in 1937-38, as a WPA project.

Although the building faces on the Parkway and there are two doors leading into the office section from that side, all equipment must leave and enter by a single wrought-iron gate on James Street at one corner of the interior courtyard in full view of the office windows, permitting a constant check on all goings and comings. All but one of the 37 entrances to the equipment section of the building are 10 feet 8 inches wide with a uniform clearance of 11 feet 7 inches, and are equipped with overhead doors, counterbalanced with springs so as to lift easily. Each entrance is flanked by triangular concrete blocks to protect the brick columns as equipment is run into the storage space, and over each numbered door is a large floodlight in addition to eight larger units mounted on the roof parapet to illuminate the entire courtyard. The yard is paved with Massachusetts Type I bituminous concrete on a rolled stone base and is well-drained by large catch-basins connected to the sewer. Two gasoline pumps in the yard in front of the office fuel all equipment, and charge slips are signed for each servicing.

The South Section

The south section of the garage, comprising doors 27 to 37, is chiefly used for miscellaneous storage. No. 37 is for small tool storage, with bins for handles, tackle, etc., and with various kinds of hand shovels, hoes, rakes and crowbars carefully stacked or in racks. One man is in charge of this section, which is kept locked at all times when he is not present. He checks out all tools, charging them to the various foremen, and again checks them in at night. The rest of the day is devoted to odd jobs around the building, including the maintenance of the lawn, with the man who dispenses the gasoline, and the washing of the garage floors.

Bays 35 and 36 are used for the storage of sand for winter use so that it may be kept dry and promptly available for sanding for ice control. Rock salt is used with the sand for ice control, and clear salt is used on the worst grades for quick action to remove hazardous ice conditions. Bays 27 to 37 are not connected to the central heating system, but Bay 37, the small tool storage, is heated with a small railroad-type stove. Bay 34 is used for the storage of ready-mixed sand-asphalt for winter patching.

The WPA units have been given the use of Bays 30-33, where they store their own tools and supplies and have a small office. All projects sponsored by the Highway Department are carried on from this office. Bays 27, 28 and 29 are used for the storage of the 12-ton, 3-wheel steamroller, barricades, portable tool-boxes and warning signs. In the summer these three bays are used for the storage of snow-plow blades, since the roller is out working most of the time.

East Section

The East Section comprises Bays 21-26 and is used for live storage and is heated with Nesbitt unit heaters. No repairs are done in this live-storage section. The snow-plow blades are set up in the late fall around the back of this garage ready for the contractors

who do the snow-plowing to drive in their own trucks and be quickly connected up with the city-owned snow-plows. Medford believes that this method is the best, since it leaves its own trucks free for ash and rubbish collection.

At the north end of this section all street hose is stored, and a sloping rack has been built for draining and drying the hose. This section of the garage has no interior columns, the roof being a 55-foot span made up of an I-beam with I-beam stringers carrying the wood beams for the flat gravel-and-bituminous roof. The floors throughout the garage section are of concrete with adequate drainage. At the south end of this same garage is a large rack for the side-boards used to build up the ash and rubbish collection trucks on Mondays and after holidays when it is necessary to make two days' collection in one day's time.

The Offices and North Section

The offices are not ornate, but practical, efficiently arranged, and easily cleaned. An office is maintained for the Street Commissioner, in addition to his office in the City Hall, and the office of the Assistant Street Commissioner is located here and is the center of all activities originating at the garage. Immediately in front of the yard office is a room for the men who are being hired in winter for snow work. A large room is also provided for city employees of the Highway Department, with individual steel lockers for the men, and a bulletin board, chairs and tables.

In the yard office are the beams for the Fairbanks platform scales located immediately outside the building. Also, an ingenious illuminated panel on the wall shows, by throwing a switch, the wind direction, so that during storms a constant check can be kept on the course of the storm. The weathervane, shown in one of the illustrations, was made in the blacksmith shop in the yard. A large lavatory and toilet room with urinal blocks is provided for the employees, and there is also a separate large shower room with hot and cold water and ample space for dressing.

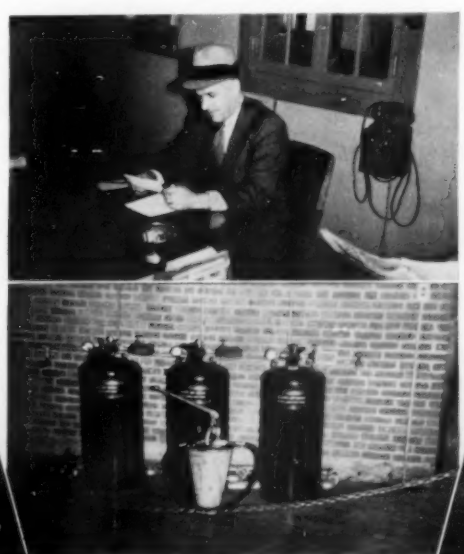
The boiler room, which provides heat for the building with the exception of the South Unit, is equipped with two International Heater Co. coal-burning burners which are hand-fired, for there is a night watchman always on duty in the yard. In summer a small oil heater is used to provide hot water for the domestic services, while in winter a heat exchanger from the heating system provides the hot water.

At the easterly end of the north section are Bays 14-20. These are used for lantern storage, for the storage of the three portable air compressors, and for the cement brick which is used for gutter paving and for manhole construction. In this section also is a diesel fuel tank for the one diesel motor grader.

West of the office section in the north unit are Bays 11, 12 and 13. No. 13 is the grease-pit with its complete Alemite lubricating system operated by air from the compressor in the repair shop. Between Bay 13 and the office is the blacksmith shop, which is most effective in handling many of the repairs to equipment. In the grease-pit all trucks are lubricated every second week. Two men are on duty from 4:00 o'clock in the afternoon to midnight four nights a week, handling the lubrication, and at the same time they make an inspection for breaks in any part of the chassis. RPM diesel lubricating oil is used in the diesel equipment.

Bay 12 is also used for lubricating equipment where it is not necessary to get underneath for the work. Bay 11 is used for storage of the 16½ to 24-ton Buffalo-Springfield tandem roller which is used for compacting stone base and for final compaction on sheet asphalt. This was the first of these huge machines to be purchased for service in New England.

The blacksmith is still a very useful man



Repairing a radiator grill and mudguards

Above, Roy F. Coates, Assistant Street Commissioner; below, the Alemite outfit at the Municipal Garage, Medford, Mass.

Left, garage door and overhead light; left center, the quadrangle inside the garage, loking toward the repair shop; right center, the gasoline pumps and main office windows; right, the weather-vane atop the office building

Repair Shop

Bay 10 in the northwest corner of the yard is the main repair shop for the Highway Department. A small-parts storage room containing tires and special tools, as well as various parts in steel bins and drawers, is separated from the rest of the repair shop by wire panels and is kept locked. The equipment of the repair shop includes an Ingersoll-Rand garage compressor, a Manley tire changer, a Manley hydraulic press, a Delta drill press, a Black & Decker buffer, a Champion spark-plug cleaner, an anvil, a Hallowell steel workbench and an Albertson Sioux valve grinder.

Additional equipment includes a Tungar battery charger, a washstand for equipment in one corner, and a monorail encircling the room and carrying three Philadelphia Block & Mfg. Co. chain falls for handling engines and other heavy parts. All equipment is thoroughly cleaned with Magnus cleaner before any work is done on it, and all trucks are completely cleaned every spring in the same manner.

West Section

The west section comprises Bays 1-9. Bay 9 is used by the sign department for the manufacture of all wooden street signs and for the carpenter shop. In this Bay is located a focusing stand for headlights on all city equipment. The carpenter shop is equipped with a combination band and circular saw.

Bays 5-8 are used for miscellaneous storage at the present time, Bays 3 and 4 by the Forestry Department for its trucks and supplies, and Bays 1 and 2 by the wire and fire-alarm maintenance crews.

The Highway Department, having the site available for this garage, took advantage of the opportunity to secure adequate storage facilities for itself for many years to come, and in the meantime is cooperating with other city departments by permitting the use of sections not immediately needed by the Highway Department for storage for other departments.

Some of the largest equipment owned by the Highway Department, such as power shovels and sand and snow loaders, as well as some materials, is stored on an open lot across James Street from the garage. A high board fence, suitably landscaped on the Parkway side, shields this lot from motorists.

Equipment and Personnel

The Highway Department is responsible for the construction and maintenance of all streets in the city of Medford, for the removal of snow from the streets and sidewalks, and for the collection of ashes and rubbish. Garbage is collected by contract. In order to carry out its many duties, a long list of equipment is necessary for the work. The important equipment is shown in the list below:

- 2 1½-ton Chevrolet dump-trucks
- 1 1½-ton Ford truck with Schramm compressor
- 1 1½-ton Dodge truck with Gardner-Denver compressor
- 1 Elgin pick-up sweeper
- 1 Case tractor for trailing equipment
- 1 12-ton Jahn equipment trailer
- 2 Model K Allis-Chalmers tractors with Baker bulldozer and Baker wings and snow-plow
- 1 Caterpillar No. 11 Auto Patrol
- 1 Caterpillar motor grader
- 2 Jaeger 2-inch pumps
- 2 Chevrolet-Ruckstell 1½-ton dump-trucks
- 7 GMC 1½-ton dump-trucks
- 3 GMC-Ruckstell 1½-ton dump-trucks
- 2 Sterling 3-ton dump-trucks
- 1 Chevrolet 1½-ton rack truck
- 1 Chevrolet 1½-ton derrick truck
- 2 Chevrolet ½-ton delivery trucks
- 1 Hauck asphalt kettle
- 1 Smith 1-bag concrete mixer
- 1 Adams road hone
- 1 Burch undertruck maintainer
- 1 1½-3-ton Buffalo-Springfield tandem roller
- 1 16-22-ton Buffalo-Springfield tandem roller
- 1 12-ton 3-wheel Buffalo-Springfield steam roller
- 2 Frinck 1-way snow blades
- 6 Good Roads 10-foot 1-way snow blades
- 4 Walsh-Holyoke 1-way 10-foot snow blades
- 3 Anderson 10-foot 1-way snow blades
- 1 New England Road Machinery 10-foot 1-way snow blade
- 1 General Excavator gas shovel
- 1 Burch self-powered sand spreader
- 1 Barber-Greene sand and snow loader with two sets of buckets
- 1 Jaeger 1½-inch pump with Sterling engine
- 1 Jaeger concrete mixer
- 1 Superior sand spreader
- 2 Horse-drawn V snow-plows
- 1 Healy catch-basin cleaner
- 1 Ransome trailer mixer

The Street Department of Medford, Mass., is operated under the direction of James C. Gillis, Commissioner of Streets, with Roy F. Coates, Assistant Street Commissioner, in direct charge of the municipal garage.

Civic Body Plans Merit Exam

The Connecticut Merit System Association, which is seeking to establish up-to-date personnel procedure in Conecticut cities and is in need of a $2,400 field secretary, has determined to "practice what it preaches" by announcing an examination for this position.

Candidates will be judged on three ratings, based on (1) experience and training, (2) a written examination, and (3) an oral interview. The examinations are open to men between the ages of 25 and 45, living anywhere in the United States, who have a professional knowledge equivalent to a college education and who have had one year's experience or training in community-wide fund-raising, executive responsibility in a public or private personnel agency; success in organizing fraternal, labor, social, charitable or civic groups; graduate training in public administration, public or group contact work, or any combination of experience and training which the examining committee deeems equivalent.

Full particulars may be obtained by writing to the Connecticut Merit System Association at 33 Lewis Street, Hartford, Conn. No applications will be received after November 4, 1940.

Chasing a Snowstorm from a City's Streets

Reading, Mass., Reports Snow Conditions and Use of Equipment in Seven Major Storms

DURING 1939 there were seven snowstorms in Reading of such intensity as to require the operation of plowing units, and the snowfall totaled 46.5 inches for these storms. In addition, there were several storms classified as "traces" only, from which slight falls of snow resulted.

Drifting During First Storm

The first storm of any consequence occurred January 30, starting at 7:00 A. M. with a temperature of 33 degrees, a slight northeast wind and a barometer of 29.9 inches, with the snow light and fine. The snow did not accumulate until 11:00 A. M., when 2½ inches had fallen. Truck plow units were sent out at 1:00 P. M., following which the snowfall gradually increased in volume, accompanied by a rising northeast wind at half gale force, which drifted the snow badly. The temperature dropped to 12 degrees by midnight, when the snow had stopped except for occasional squalls. The total snowfall for this storm was approximately 8½ inches.

Truck plow units continued plowing through the night, widening streets and clearing drifts. Horse-drawn sidewalk plows covered their routes twice, while the tractor sidewalk plows covered their own routes and then aided on the horse-drawn plow routes. The tractor sidewalk plows have, on all occasions used, proved very efficient, often covering sections of horse-plow routes after their own routes were completed.

The second storm of the year occurred on February 7, resulting in 4 inches of snow. Truck plows quickly covered their routes, and tractor sidewalk plows, after covering their regular routes, covered all the horse-plow routes, since these plows were not called out during this storm.

Wide Temperature Range

On February 15, with temperatures at normal levels, a slight snowstorm started. This snow, with rising temperatures, soon turned to rain, and the temperature continued to rise rapidly to a high of 66 degrees for the day. Owing perhaps to the sudden rise in temperature, a thunderstorm occurred, accompanied by heavy rainfall, which amounted to 0.71-inch. The accumulated snow from previous storms quickly melted and caused numerous flooded streets. As snow melted off the ice-coated roads, extremely slippery conditions occurred, and when the streets were sanded the rain washed off the sand, nullifying the work of the sanding crews.

At 11:00 P. M. of this day, February 15, the temperature dropped rapidly and the rain turned to snow. The water on the streets froze rapidly and, covered by a light coating of snow, again caused slippery conditions on both streets and sidewalks, both of which were immediately sanded. During the night the temperature dropped to 5 degrees, showing a temperature change of 61 degrees in less than 24 hours.

A Week-End Storm

The next storm of major proportions occurred on March 11, 12, and 13. Snow started falling at 5:00 P. M., Saturday, March 11, with the temperature at 28 degrees and the wind moderate. The snow was light and dry. Sand trucks were sent out as the roads became slippery from the traffic-packed snow. The snowfall gradually increased in volume until at 4:00 A. M., Sunday, March 12, 4 inches of snow had accumulated and the snow continued falling heavily. Truck plows had been rigged by the regular snow crew and were started to work at 5:00 A. M., the tractor sidewalk plows started at 5:00 and 7:30 A. M. respectively. One tractor had been under repair before the storm started and had to be reassembled before operating. The horse-drawn sidewalk plow drivers were notified to start work at 5:00 A. M. and went out as soon as the horses could be fed and harnessed.

All streets and sidewalks adjacent to churches were cleared of snow before church services began. By noon on Sunday all plow units had covered their respective routes, and snow-plowing had practically ceased, with the skies clearing and 6 inches of snow on the ground. Snow-removal work was started from the Town Square at 11:30 A. M. with a crew of twenty men and five town trucks. The work was quickly and easily accomplished, having been completed at 4:00 P. M.

Snow again began to fall at 5:00 P. M. on Sunday, March 12, with a temperature of 30 degrees and a moderately fresh wind. By 7:00 P. M. the wind had freshened to gale force and approximately 4 inches of snow had accumulated, with the snow piling up rapidly. The truck plows, which had been dismantled for hauling snow, were quickly rigged and sent out, as were the tractor sidewalk plows. Horse-drawn sidewalk plows were called into action at midnight and started around 2:00 A. M. By this time, approximately 12 inches of snow had fallen, and the high wind had caused drifts to form in many sections. The snow continued to fall steadily until near noon on Monday, March 13, when it had

virtually stopped. Snow removal was started on the square in anticipation of the annual town meeting scheduled for that night. A fleet of ten hired trucks and a crew of forty-one shovelers were employed in snow-removal work, continuing until midnight Monday, March 13. Approximately 14 inches of snow fell during this second storm.

Tractor Plow Units to the Rescue

The horse-drawn sidewalk plows were unable to cope with the heavy fall of snow, even though some of the drivers hitched their horses up tandem, two horses to a plow. The sidewalk tractor plow units quickly covered their own routes and were then sent out to cover the horse-plow routes, continuing through Wednesday, March 15. High winds caused much drifting of snow, and street plows were continually engaged in dragging streets through Wednesday. Wednesday evening a thaw had melted the snow on the roads and rain began. All street plow units were sent over their routes to push back the resulting snow and slush.

The rain continued through Wednesday night and Thursday morning, with the melted snow flooding the highways. Crews of men were sent out to open catch-basins and culverts, and drain pools of water from roadways wherever possible. The slush and melted snow were plowed from the streets again on Thursday, March 16. Falling temperature that night caused icy streets, which were sanded. The temperatures throughout the week were such that the traffic-packed snow on the roads would not melt enough to allow the plows to strip the snow to the street surfaces, necessitating repeated plowing to clear the roads.

Other snowstorms occurring during 1939 were as follows:

February 22—Snow-fall 1 inch, temperature plus 20 degrees, wind slight.

March 9—Snow-fall 5 inches, temperature plus 28 degrees, wind moderate.

December 11—Snow-fall 3 inches, temperature plus 24 degrees, wind moderate.

December 30—Snow-fall 5 inches, temperature plus 20 degrees, wind moderate.

Philip Welch is Superintendent, Board of Public Works, Reading, Mass.

Community Industrial Development and National Defense

By ASA S. KNOWLES
Dean, College of Business Administration, Northeastern University, Boston, Mass.

COMMUNITIES which keep abreast of events and developments in the preparedness program may discover excellent opportunities for improving their local employment conditions, and at the same time render a service to the nation by making known and offering for use the facilities and skills which are needed, and in which they have special advantage.

In the balance of relative preparedness between nations today, strategically located industry is worth large numbers of aircraft, warships, tanks and artillery. Adequate defense requires not only the provision of arms during peace, but also the continuous flow of food, equipment and clothing, as well as munitions in time of war.

A Constructive Approach for the Local Community

It is recognized that wasted time and confusion in the attainment of our sorely needed industrial mobilization may result if those charged with its conduct at Washington are besieged by industry seekers. The writer believes, however, that industrial mobilization can be constructively aided if properly handled from the community's approach. These steps are essential:

1. The community must analyze its advantages and disadvantages from the viewpoint of serving manufacturing industry. This demands that the community make a *survey* of its assets and liabilities and endeavor to determine what types of industry it can hope to support and hold.*

2. Upon completing the survey, the data must be compiled for both effective and brief presentation; it must be so arranged that the industrial mobilization authorities or others seeking industrial plant sites will be able to appraise a community's potentialities very quickly. (Many towns and cities compile data for a convincing story and bury it in their presentation.)

3. Each community seeking industry must endeavor to discover its special advantages, if any, which are of particular value under a war economy. Typical of these are the possession of strategic raw material or natural protection from border or aerial attack, a terrain and climate conducive to airplane production, testing, flying, etc. (Strategic materials, but essential, are: mica, nickel, mercury, etc. Examples of non-strategic materials are: asbestos, bauxite, and platinum. Other essential materials include cork, hides, wool, iodine, etc.) †

4. Those communities having industries which are unstable and for which they no longer have advantage as places of location will do well to try to supplement or replace them, if they cannot be made more stable and permanent than at present. The present situation may provide the necessary impetus.

The Community Survey

No town or city can properly appraise its advantages or disadvantages as a potential and desirable site for manufacturing industry except as they have complete and detailed information about their government, tax situation, markets, available raw materials, available factory buildings, etc.; for example, with respect to available labor they must know the types of skill available and the numbers in each skill classification.

Industrial survey data are most valuable when used as a basis for determining the particular types of industry the community can hope to attract and hold. Information is available through several sources as to what location advantages different industries seek.* In addition to the industry's own factors, because of present conditions particular attention must also be given to the following:

* See THE AMERICAN CITY for January, 1939: "Getting the Industry Best Suited to the Community."

† Undoubtedly the War and Navy Departments can furnish reliable information on strategic and essential materials, etc.

1. Whether or not available labor is free from fifth column influence.
2. The hazards from possible border attacks, air raids, etc.
3. Favorableness of climate and terrain for airplane production, testing, flying, etc.
4. The possible existence of power for immediate use, thereby saving both time and cost in the construction of power facilities.
5. Available buildings which have been used for some previous war industry or which are readily adaptable to such use.

Immediate Action Urged

Industry will be mobilized to meet the national defense needs as quickly as possible. Consequently, towns and cities seeking industry and wishing to profit from the national defense program must not delay action in securing data that will warrant attention. They cannot expect to receive cooperative response unless they have specific data and set forth their offerings honestly and fairly. The industrial coordinator for mobilization must establish new locations and recommend expansions on merit, and not political or personal favoritism. The stakes are too great to do otherwise.

Who Will Direct National Industrial Development?

It is not yet clear who will decide the location of new industries and the expansion of existing ones. The National Defense Advisory Commission is now restricted to an advisory capacity. If it should be granted powers similar to those exercised during the last war by the War Industries Board, the authority will be largely in the hands of William S. Knudsen, who heads the production division of the Commission. In this he will have the advice and support of the other Commission members who head its raw material, transportation, and labor divisions.

Coordinating Agency Needed

The present locations of many manufacturing industries in the United States are the result of fortuitous selections of plant sites. As the country's industrial organization has expanded and matured, there has been considerable shifting and migrating of industry. This has caused unsettlement, widespread local strife, and the growth of agencies whose sole purposes are to hold and attract industry. In brief, there has been a veritable battle for the smokestacks. If U. S. industry is to serve the country to best advantage in its present crisis, and in an eventual new world, there should be established a National Coordinating Agency or central authority to study national industrial organization and industrial migratory trends. This agency should recommend action and policies which, if followed, will insure most profitable use of the nation's industrial resources and provide a maximum of national security. Its guiding principles should be:

1. The location of new industries (public and private) according to scientific principles which will assure their maximum productive efficiency. Exceptions will occur because of defense needs.
2. In so far as possible, plants now situated in places which no longer have advantage for them should be shifted to where they can produce most efficiently and profitably.
3. Every effort should be made to discover means of rehabilitating (shifting production lines, etc.) of those plants which cannot be moved profitably, but whose facilities can be made profitable if given proper management attention.

Parking Studied in Bakersfield

By J. HOLFELDER
City Engineer, Bakersfield, Calif.

PARKING should not be permitted where it interferes with public safety. There is no valid reason for permitting parking in any location which will decrease the visibility of the driver or the pedestrian and thus create an accident hazard. The principal function of a business street is to provide for traffic movement *and* essential service. Business areas must be accessible and free from congestion, and vehicles must have free movement if the property values of the district are to be maintained.

The installation of 325 Dual parking meters in 1937 relieved congestion in the central business district of Bakerfield,* though with a proportionate increase in parking business congestion in the areas immediately outside the metered sections. Certainly their installation has been a material aid to the enforcing of parking regulations and has reduced the number of officers required to obtain the same degree of observance.

Parking convenience is an essential service

It must be borne in mind that parking meters are installed on only 8 per cent of the business-district curb. Parking is prohibited on 5 per cent of the curb space; permitted for 20 minutes on 4 per cent, and two hours on 83¼ per cent of the curb space. The remainder of the space is for bus stops, taxi stands and loading zones.

If the public insists on good enforcement in the interest of better traffic movement and parking conditions, the police department can provide the desired degree of effectiveness.

This can be accomplished economically through the use of meters, or it can be accomplished without meters and the use of a larger enforcement personnel. If streets are to maintain their maximum utility as avenues of communication and access, it is necessary that there be adopted a comprehensive parking plan supported by effective enforcement.

PHOTOGRAPH BY COURTESY OF U. S. DEPARTMENT OF AGRICULTURE

What Are Fire Insurance Rates?

NO matter how much arithmetic is used in figuring fire insurance rates, they rest on no mathematical or statistical basis. There is a variety of schedules in different sections of the country. Each of these schedules has been worked out more or less independently of the others. The best mathematician in the world cannot check them. A man who has studied the cases of thousands of fires could pass judgment on the general fairness and intelligence of any rate schedule, but might differ as to the weighting of the various penalties. His yardstick would be his experience compared with the experience of the man or men who worked out the particular schedule.

How would you set a rate? Suppose, for instance, your neighbor asked you to insure his home out of your own resources. His house is like yours, he is much like you, and has never had a fire. What would you charge him? Probably you would not do it at any price. You would probably feel that you could not afford to take a chance on losing $10,000 even for $1,000 a year. Because you could not gage the risk and would lack the underwriters' protection of the law of averages as based on long experience over wide areas.

The entire business of fire insurance rests on a shrewd estimate of the likelihood of accidents. Naturally, the companies desire to make profits; but their first necessity is to pay losses promptly and fairly. The company that does not do this will soon dry up and disappear.

A manufacturer knows his cost, and to a dollar or a cent how much he must charge in order to stay in business. Operating costs can be calculated and controlled and are a relatively fixed factor in the price of insurance. The major and determining expense is losses, which are completely beyond the control of the company. They can be controlled only by the client through his carefulness, and the municipal government through its adequate fire department, water works, building codes and general watchfulness.

Fire Prevention

One reason more why disasters do not occur is the energetic fire-prevention work that has been done, especially during the last five to ten years. Who has done this work? To a very considerable extent the fire departments of the cities have done it, aided and advised by various organizations and associations. National Clean-up Week, Fire Prevention Week, plaques and citations, are all examples of an effort to publicize good housekeeping and fire prevention. That the success of these drives and contests decreases fire losses or increases the annual surpluses of the companies, is a proof of their value to the communities, including the humblest forgotten family. Even if the sole motive behind fire prevention were to increase insurance profits, the result is of incalculable value to property owners and city governments. Without the drive furnished by this incentive, it is a question how successful fire-prevention activities would prove. This drive and direction, moreover, are furnished clients and cities free of cost, being paid for out of premiums which, because of the effort, do not have to be paid back in losses.

Any city feeling that the government or its citizens are paying too much for fire or allied insurance can appeal—not only to the state fire insurance commissioner and to the companies' rate-making body, but to individual fire insurance companies as well. Leading companies, such as The Home Insurance Co., 59 Maiden Lane, New York, are making their engineering services available to municipal governments. Here is an opportunity to pierce controversy and conversation and find out whether or not the companies maintain capable nation-wide engineering departments to improve their service and good-will and in that way increase the volume of their business. They

have the talent. During the last five years one state rating bureau has lost 25 raters and inspectors, who resigned to join fire insurance companies. This is an indication of the companies' desire to cut clients' insurance costs by reducing the physical hazard.

Making use of this service not only cuts premium costs, but eliminates fire hazards as well. Several years ago the Schedule Rating Office which makes the rates for most of the insurance companies operating in New Jersey was asked to study the fire hazards of the Essex County, N. J., institutions. One of the worst hazards found was the laundry of Overbrook Hospital, and sprinklers were recommended. They were not installed, however. For ten years the county had been paying an annual premium of $16,000 on this institution. Recently the laundry burned to the ground, with a loss amounting to $165,000 for this one structure. Had sprinklers been installed, the loss might have amounted to $50. A new laundry building is being erected, fireproof and equipped with sprinklers. Incidentally, the study made by the Schedule Rating Office was worth $5,000, and was furnished free, paid for, of course, by the insurance companies.

What Are Rates?

There is much talk at this time of investigating fire insurance rates. Has anyone a glimmer of what might be discovered? What is the basis of rates? In the first place, there are numerous rate-making bodies in the United States, each pursuing its own method, but with a common philosophy.

The insurance companies subscribe to the local rating bureau and agree to adhere to its rates, although if a member company feels that a rate is too low, it can refuse to write business at that rate. Schedules for a particular class of risks start with the base rate for class divisions, and the final rates published are arrived at by taking into account credit allowances and deficiency charges provided in the schedules for variations from normal. To the extent that the companies are permitted to do so, they collaborate through the bureau in the formulation and modification of rate schedules promulgated for a particular state or area.

In a certain state, recently, the stock companies began complaining that the mutual companies were skimming the cream of the garage insurance. The rating bureau reduced the rate on garages 40 per cent.

At almost any time, one or more agents may be found at the rating bureau, arguing for a reduction of rates or penalties on some prospect's property. Every agent has available cards showing the published rate on every commercial and industrial property in his community. He studies these schedules to figure out how he can get a lower rate and consequently the business.

Municipal Insurance Worst Handled

Expert insurance men say that insurance of municipal properties is the worst handled of all insurance. Where politics is played, the situation is as may be expected, and any talk of lower rates is buncombe. One city automobile was found to be insured in five companies. This situation, however, is said to have improved steadily during the last few years. Certainly the present controversy has been roused up by officials of cities that believe they have clean-cut insurance programs but that rates are still high.

Among the smaller municipalities especially, the fault, if any, seems to be lethargy. Nothing is done. The rating bureau is not asked questions. The big companies are not asked for engineering advice. Boards of education, advised by their associations such as the district boards and district clerks, and having only one class of buildings, are apt to handle their insurance more economically and efficiently than municipalities. School boards are likely to be more conscious of the need for safety because of their responsibility for the care of children.

What to Do

The first step toward smaller premium payments is to call in engineering talent and have the municipal problem studied. The resulting report will be valuable in proportion to the use that is made of it. If there is a sincere desire to cut out waste, then all the recommendations which can be economically followed will be carried out. The result will be a streamlined insurance program which amply protects without wastage.

Oshkosh, Wis., for instance, believes it has achieved such a program, and the City Comptroller will describe it here in an early issue. This will be followed by a discussion of the fire insurance problem from the point of view of the American Municipal Association, by Earl D. Mallery, Executive Director of that organization.

RESULTS OF STOCK FIRE INSURANCE 1921 TO 1939 INCLUSIVE—
UNDERWRITING—RATE LEVELS—BURNING RATIOS—LOSS RATIOS

	Risks Written	Premiums Received	Losses Paid	Aver. Rate of Prem.	Ratio % of Losses Paid to Risks Written	Loss Ratio % of Losses Paid to Premiums
1921	$49,373,684,409	$520,800,771	$303,513,839	$1.05	.61	58.3
1922	54,632,686,788	545,463,196	311,687,842	1.00	.57	57.1
1923	64,212,007,615	622,240,735	329,112,510	0.97	.51	52.9
1924	63,277,574,352	616,658,714	341,431,657	0.97	.54	55.4
1925	68,227,758,159	661,457,254	364,213,919	0.97	.54	55.1
1926	74,791,178,945	699,058,896	367,611,295	0.93	.49	52.6
1927	71,141,015,500	673,053,184	313,357,834	0.95	.44	46.6
1928	73,218,703,220	675,441,184	311,198,710	0.92	.43	46.1
1929	77,355,797,114	687,732,495	317,718,274	0.89	.41	46.2
1930	70,997,367,695	609,039,337	346,110,887	0.86	.49	56.8
1931	66,883,275,999	539,257,220	319,387,107	0.81	.48	59.2
1932	60,179,367,141	469,310,686	288,774,979	0.78	.48	61.5
1933	58,118,765,056	431,574,700	196,598,685	0.74	.34	45.6
1934	63,858,663,383	456,877,233	195,569,246	0.72	.31	42.8
1935	65,322,260,987	460,748,917	154,196,767	0.71	.24	33.5
1936	63,179,552,334	447,330,231	172,400,078	0.71	.27	38.5
1937	64,941,176,071	448,152,502	160,711,307	0.69	.25	35.9
1938	63,045,637,053	434,070,088	166,457,800	0.69	.26	38.3
1939	63,944,333,098	425,787,431	179,243,244	0.68	.28	42.1
	$1,236,700,804,919	$10,424,054,776	$5,159,273,780	$0.84	.42	49.3

NOTE:—The ratio of losses paid to premiums received was 58.3% in 1921 and 42.1% in 1939, a drop of 27 *per cent*. The average premium rate was $1.05 in 1921 and $0.68 in 1939, a decrease of 35 *per cent*.

Spot Cash for CBM Street

Litchfield, Ill., Dances in the Street to Celebrate Widening of Main Street by WPA and Assessment

By CHRIS F. ZUBER
City Clerk,
Litchfield, Ill.

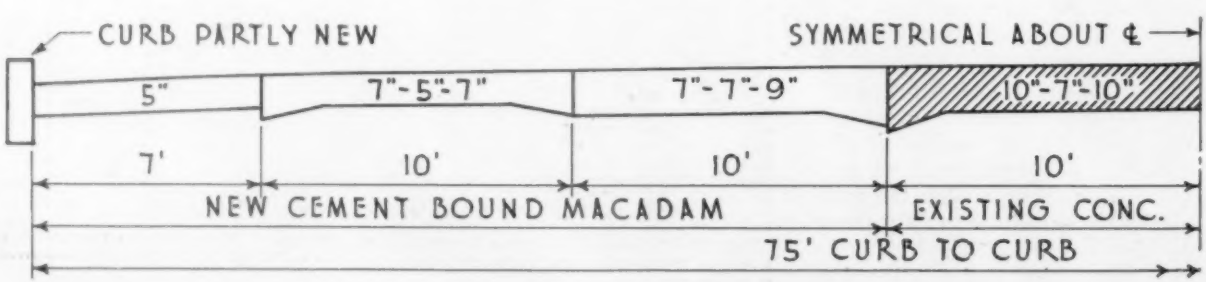
SMALL municipalities often are up against a real problem when it comes to financing street improvements. Major public works cost money. That money usually is supplied by benefited property through special assessments, by the taxpayers at large from a general fund, or through a combination of these means. Federal assistance is another means of partial financing.

For ten years the main street of Litchfield, Ill., has needed a permanent surfacing on each side of a center 20-foot concrete strip, which was built a number of years ago. The street is 75 feet wide, so it is obvious what difficulties were encountered in bad weather when motorists left the center strip.

Merchants felt that the improvement should be financed entirely with motor-fuel tax funds; the City Council felt differently. Finally, a WPA project was set up, and estimates were made whereby property owners would be assessed $1.75 a front foot, with an additional 25 cents for curb. All assessments had to be paid before work started. The improvement, therefore, was paid for with spot cash.

Cement-Bound Macadam

Since we were anxious to get as much for our money as possible, and since effective use of relief labor was a major consideration, it was decided to build cement-bound macadam. This type of construction not only used relief labor to good advantage, but allowed us to do the work with



considerable speed.

Construction consisted in 27½ feet of widening on each side of the 20-foot strip for a total length of 1,080 feet. This covered three blocks on North Main Street, the main part of the business district. Work was done in three strips—two 10-foot and one 7½-foot strip on each side of the street. The 7½-foot strip, being the parking area, was built 5 inches thick, while the four travel lanes were thickened as shown in the sketch, to adjust the new street sections to that of the 20-foot center lane.

Old vitrified brick was broken up to form most of the aggregate, but in all cases the top 2 inches was composed of commercial limestone. This was penetrated with the usual 1:2 portland cement mortar.

As is often the case when methods are new to those doing the work, we had some trouble at first. Before we proceeded far, however, the job was running smoothly. Some of the construction details may interest other municipalities faced with the same problems we had.

The CBM Roller and Joints

When work started, we tried to compact the aggregate with a heavy tamper, but found that it was a lot of hard work with very little success. Accordingly, a heavy roller was used that compacted the aggregate much more easily and quickly. The roller was made by filling a tubular section of iron 2 feet in diameter and 3 feet 6 inches long with concrete. A 1½-inch steel rod was set in the center as an axle. A timber frame built of 4 x 4's was attached to the axle, and to this frame a tongue from an old farm cultivator was bolted. Five eyebolts were set in the tongue, and through these ran iron pipes 1½ inches by 2½ feet long, for pull-handles.

Several methods of putting in contraction joints were tried, and the one which proved successful was as follows: An iron plate 3/16-inch thick, 2½ inches deep, and 10 feet long was set to line and grade before the aggregate was spread. This was left in until the grouting had been done and the cement had partially set, when it was removed by the finishers. The slot was then filled with mastic. Metal expansion joints were used.

One strip at a time was built. It was discovered that much better results were obtained by building the section next to the center strip first, and the one adjacent to the curb last. We tried building the center strip last, but the 1-2-3 method was much less troublesome.

The bull tamper we first made for compacting the aggregate before grouting was not discarded when the roller was put into use. We used the bull tamper for compaction after the aggregate was grouted.

Costs

The cement-bound macadam cost about 81 cents per square yard for material and $2.40 for labor. This cost is high, but it was a relief project and all labor had to be trained on the job. Cost also included uncovering all water mains, and labor for installing new services. The project was carried through with the cost for materials divided as follows: property owners, $3,976.77; the city, $1,208.50; and WPA, $1,314.73. WPA also furnished all labor.

"The Homes They Come From"

IN the evacuation of boys and girls from the congested urban slums to rural areas of England, the handicaps suffered by children in substandard neighborhoods have been brought home forcibly to many citizens heretofore little interested in the housing problem. The following paragraph on this subject is from a recently published report of The Housing Centre, of London:

"Another aspect of evacuation, which soon became apparent, was the shock which foster-parents received at the condition and behavior of children from urban slums. The Centre believed that this could be made into a powerful force for the improvement of housing and social conditions if it were rightly understood, and a small touring exhibition, 'The Homes They Come From,' was made to show the conditions of life in some of our big towns. This emphasized the importance of good houses and environment, and also of the kind of education which would enable the people to make a real home out of the new dwellings. This could be given through house property management and social activities for children and adults. The exhibition, after a successful opening by the Hon. Margaret Bondfield and the Bishop of Chichester, has been continuously on tour since the beginning of April. It has visited Bournemouth, Brighton, Hull, and Worthing, and has also been shown at Gresham's School, Holt. Further bookings are at Roedean School, Brighton, and Bishop Otter College, Chichester. Other exhibition material, photographs, and films have been lent for meetings, and last year's summer exhibition, 'Housing in Great Britain,' has been shown at Coventry and Chichester. We have found that there has been a new interest aroused in housing matters, and in spite of the difficulties of arranging meetings we have repeatedly been asked for speakers, slides, films, etc."

The Business Section of Litchfield, after the 20-Foot Concrete Pavement Had Been Widened on Each Side 27½ Feet with Cement-Bound Macadam

Water Treatment

Iron Removal by Aeration and Filtration—Softening by Upward-Flow Beds of Zeolite—Results and Costs

By WALTER W. GRAF
City Engineer,
Lancaster, Ohio

LANCASTER, located approximately at the center of population of the United States, has a population of about 22,000. Its business activity is dependent about one-half on agriculture and the other half on industry. Some of the products manufactured in Lancaster are glass, shoes, paper, carbon, and foundry and machine products.

The first public water supply was built by the city in 1877 and was constructed solely for fire protection. It was obtained from an infiltration tunnel built through approximately 1,000 feet of low, wet land in the western part of the city. The distribution system covered the main part of the town and served its intended purpose until about the turn of the century, when it was felt that a sanitary supply that could be used for all purposes should be secured. After drilling several test wells, it was decided to locate the pumping plant in the Hocking River Valley along the western part of the city, where an unlimited quantity of pure well water was found in a gravel formation approximately 100 feet below the surface. This water was highly satisfactory from a sanitary standpoint, but showed a total hardness of about 360 ppm with 4 ppm of iron, which at that time did not seem highly objectionable.

By 1932, the daily demand had increased to approximately 900,000 gallons, and considerable dissatisfaction was evidenced owing to the hardness of the water and the high iron content. Upon recommendation of the Mayor, the City Council passed the necessary legislation in the spring of 1932 to finance the construction of a water-softening and iron-removal plant.

The plant was designed for an ultimate capacity of 3 mgd with three softener units and three filter units, each having a capacity of 1 mgd. Two of the units were equipped under the original contract awarded in 1932, and the third unit, not equipped, was constructed for future additional capacity.

The plant was put into operation on March 4, 1933, and since that time the average daily demand has increased from 900,000 gallons per day to 1,310,000 gallons. This increase is attributed to the better quality of the water and a healthy growth in the population. With the better quality of water, it was possible to raise the rates 33 per cent with but little objection from the consumers, and at the same time, the use per capita increased. This increase in rates and use has provided more than enough revenue to pay the interest and retire the bonds for the improvement as they become due.

Because during the summer of 1938 there was a demand on a few days in excess of 2 mgd, it was thought advisable to equip the other softener and filter units. This work was done in the early part of 1939 as a PWA project. The construction was done by Freeman & Jones, Inc., in accordance with the plans and under the direction of the writer.

Raw-Water Supply

The plant as now operated received its supply from three Peerless turbine pumps set in deep wells and producing approximately 2,100 gpm of water with the following average analysis:

CO_2 carbon dioxide	35.0 ppm
Iron	3.0 "
Alkalinity	300 "
Total hardness	365 "

Iron Removal

The well pumps discharge through a 14-inch main to the inlet of a two-unit Aer-O-Mix located on top of the reaction or retention

basin, which has a detention period of 20 minutes when the plant is operated at its maximum capacity of 2,100 gpm. The tubes of the Aer-O-Mix extend down into the basin with their discharge just above the top slab of the basin. The top of the basin is walled and the water from the Aer-O-Mix collected on it is discharged through a vertical pipe extending to within 36 inches of the basin floor. A concrete baffle through the center of the basin forces the water to pass from the bottom of the drop pipe around the end of the baffle wall to reach the outlet, which is near the top at a point farthest from the inlet. A float switch in the basin controls the deep-well pumps, restricting the maximum variation in water level to 3 feet. In the passage of the raw water through the Aer-O-Mix and the reaction basin, 50 per cent of the carbon dioxide is removed and all the iron is oxidized and sufficiently precipitated so that it is removed entirely by the sand filters. Because of the rather high velocity through the basin and the colloidal nature of the ferrous precipitate formed, there is very little settling in this basin.

The water from the reaction basin flows by gravity to the three sand filter units, which are of conventional construction. Each filter is provided with an Infilco five-valve hydraulic operating table equipped with indicating rate-of-flow and loss-of-head gages, and an effluent rate-of-flow controller, and has Wagner underdrains.

A steel elevated wash-water tank with a capacity of 40,000 gallons is located just outside the building. A 250 gpm pump is provided to fill this tank with sand-filtered unsoftened water. This pump takes its suction from the sand-filter effluent header and is controlled by an altitude switch, making its operation entirely automatic.

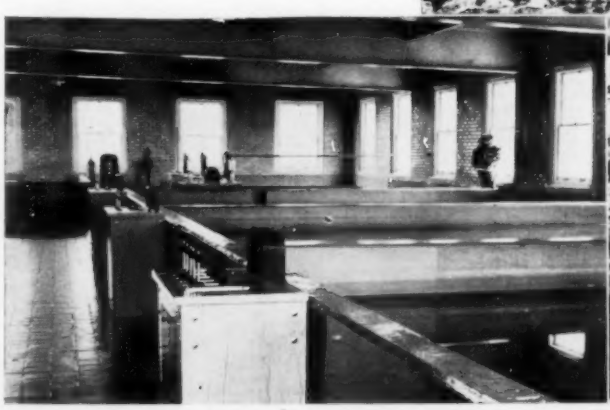
Zeolite Softening Units

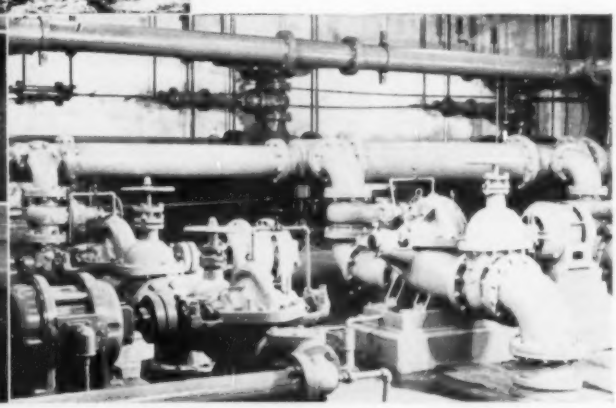
The effluent lines from the three filters enter a common header from which the suctions of the transfer and wash-water pumps are taken. The transfer pumps discharge into a common header which supplies the three zeolite softening units. Each zeolite unit has an inside dimension of 9 x 11 feet and contains 450 cubic feet of Infilco Crystalite, a manufactured gel-type zeolite. The water to be softened flows upward through the zeolite bed and is collected by two troughs similar in construction to filter wash troughs with their top edges very carefully leveled so that the softened water flowing up through the beds is evenly collected. The troughs in the original units were made of steel and painted for appearance. The maintenance of the paint on these troughs has been the most difficult problem we have had in connection with the plant, and it is still unsolved. In constructing the third unit, the troughs were made of steel covered with porcelain enamel and have been very satisfactory.

Each softener unit is provided with a five-valve operating table on which is mounted an indicating and recording rate-of-flow gage. In the common header from the softener units is a proportioning mechanism actuated by venturi tubes in the zeolite influent line, operating a hydraulic gate-valve in a by-pass line, thus maintaining a definite proportion of hard to zero-hardness water.

The storage basin for the salt used to regenerate the zeolite beds is constructed of reinforced concrete and has a capacity of approximately 1½ carloads of salt. A brine-measuring tank is located in the pipe gallery into which the brine necessary for one regeneration is drawn and diluted to approximately 12° Baume before being pumped into the softener to be regenerated.

From the measuring tank the brine is pumped through a brine header to the surface of the zeolite units. This pump is started by push-button switches mounted on the end of each zeolite operating table, and stopped automatically by a float switch in the measuring tank when the proper quantity of brine has been delivered to the softening unit. The brine enters the freeboard above the zeolite through a distribution system consisting of crossed pipes with the ends at the corners of the zeolite basins. After the brine has been





***Features of the Iron-Removal and Zeolite Water-Softening Plant** at Lancaster, Ohio: Above, the Splash Plates of the Aero-O-Mix; Left, the Operating Floor of the Plant, Showing the Sand Filters, Softeners, Operating Tables and Chlorinator; Right, the Transfer Pumps and Pipe Gallery for the Softener Units*

introduced, water is drawn into the basin in the space above the beds and allowed to flow downward through the zeolite at a slow rate. The waste water and brine is collected at the bottom of the unit and conveyed to the sewer.

At one end of the zeolite operating floor is a table on which is mounted a gage indicating the rate of flow during each step of the regeneration. This table is also provided with vacuum sampling devices for obtaining samples from the bottom of the units during regeneration, and from the top during the softener runs. There are two rates employed: during the first period the brine is passed slowly through the zeolite; and during the final period wash water is passed through rapidly to wash out the last traces of brine after it has completed its work. Each zeolite unit is out of service about one hour for regeneration between softening runs.

Chlorine and pH Control

A clear well with a capacity of approximately 100,000 gallons is provided, to which the suction header of the high-service pumps is connected. To the line between the zeolite softeners and the clear well, chlorine at the rate of approximately 2 pounds per million gallons is applied by means of a Wallace & Tiernan visible vacuum chlorinator as an added sanitary precaution. This was installed when the third units were equipped. Soda ash is added at the same point for pH control. This is applied at the rate of approximately .410 pounds per million gallons by means of a Jeffrey dry feed machine.

Results of Operation

Each of the three softener units contained 450 cubic feet of zeolite when put in service and showed a capacity of approximately 12,500 grains per cubic foot with an average length of run of 7.5 hours when softening water of 21.2 grains hardness. Since the original units were put into service, zeolite has been added to each of the two as follows: February 22, 1935—25 cubic feet; and February 13, 1938—22½ cubic feet. At the present time approximately 50 cubic feet should be added to each of the two original units to bring them up to the original 450 cubic feet.

The zeolite in these two units now has an exchange capacity of 9,400 grains per cubic foot. The salt consumption of the new unit is 0.33-pound per thousand grains of hardness removed, and the old units about 0.42 pounds per thousand grains, and the water required for regeneration averages about 6.5 per cent of the water pumped to service. The salt cost of the zeolite treatment is about 3 cents per thousand gallons. The average hardness is reduced from 21.2 to 4.2 grains. The delivered water is free of iron, which is removed by the sand filters, which require 4.7 per cent of the water pumped to service for filter washing.

The supervision of the operation of the plant since being put into service, as well as the design and supervision of all improvements and additions thereto, has been under the direction of the author. The original plant was designed by Charles P. Hoover, consulting engineer, Columbus, Ohio. The plant is operated by Harry Stalder, Superintendent, and E. D. Deeds, C. Keller, and R. J. Harris, operating under licenses granted by the Ohio State Department of Health.

Avoiding "Census Jitters"

PRELIMINARY and partial local population-counts of the Census are now sufficiently numerous to indicate what may reasonably be expected from the complete report.

In a recent radio talk, William L. Bailey, Professor of Sociology of Northwestern University, called attention to the fact that what the current Census so far reveals is in continuance of trends recognized since 1910. When it is noted that many great cities are *losing* for the first time in their history, it must be remembered that this was preceded in most of those cities, in previous decades, by a steadily declining rate of growth.

"This country," said Professor Bailey, "needs some different criteria of judging business and society than the traditional one of mere numbers—the result of an expanding and young country. Quantitative standards must now—and quickly—be replaced by qualitative ones.

"The population of the country is now about equally divided as a third each to great city, small city and town, and country. Urbanism, whether as all classes of urban places (towns and cities generally) or of the great cities, or even of suburbs, is no longer the dominant 'feature,' as ruralism was earlier in days of the frontier. *A better balanced country, with interurbanism dominant seems ahead.*

"This is not inevitable, of course, if the recognition of the trend leads to the proper adjustments being made on city and regional planning and metropolitan reconstruction generally. The current Census only *'flashes danger signals.'*

"The last twenty years have not been a depression but an almost epochal crisis. The many 'booster estimates' made in all parts of the country in the early thirties—foreseeing return trends of the traditional type—are now to be revised. Those were so far from eventuating that the estimates for a mere dozen great cities are now seen to exceed the total gain of the nation.

"All this compels communities to emphasis on conditions of general welfare and living conducing to natural increase of population and to holding and attracting of population. Criteria other than mere population size and growth will have to be used."

Effect on Grants and Shared Taxes

The Bureau of the Census, through its Division of State and Local Government, calls attention to the fact that:

Of the many important results of the 1940 Census, not the least is the effect it will have on the $160,000,00 in grants and shared taxes distributed by the Federal Government to states, and by the states to their minor civil divisions on a per capita basis.

In the year 1938, the Federal Government distributed about $90,000,000 in grants to the states in proportion to the population—either rural, urban, or total—in each state. The states distributed about $70,000,000 in grants and shared taxes to their minor civil divisions on a population basis.

The Federal grants which are made on the basis of population are largely for highways, agriculture, and vocational education, while the state grants and shared taxes are chiefly for general purposes and highways.

The extent to which the 1940 Census will affect the amounts received by a particular state, county, city, or other minor civil division will depend, of course, upon its change in population in relation to that of other governmental units sharing in the distribution. It is probable that the changes in amounts distributed will not be made effective until the final, corrected population figures are released, which, it is expected, will be early in 1941. The effect of the 1940 Census will therefore probably not be felt in most jurisdictions until 1941 or 1942.

—See other material relative to the 1940 Census on pages 83 and 111, this issue.

A Notable Waterfront Improvement

Charleston's Kanawha Boulevard Relieves Traffic Congestion, Prevents Soil Erosion, Decreases Flood Hazards, and Improves Commerce Facilities

By Alice Partlow Curtis

CHARLESTON, West Virginia's capital city, now boasts of one of the greatest waterfront improvement projects attempted in the United States, with a 60-foot-wide, 6-lane boulevard recently completed on the north bank of the Kanawha River and stretching for 5 miles, from the east end to the west end of the city.

The rapidly increasing population of Charleston, as it became one of the largest organic chemical centers in the world, found the city's traffic facilities obsolete and its traffic problems acute. Although located on important routes, the city was a bane to motorists who had to wind their tortuous way through narrow and congested streets. A modern thoroughfare was essential.

Completed now at an approximate cost of $3,500,000, the Kanawha Boulevard serves to relieve the crowded traffic condition, and, in addition, has been so constructed as to prevent soil erosion on the banks of the Kanawha, to decrease flood hazards, and to improve facilities for water-borne commerce. Business buildings, residences, sidewalks, curbing and streets were razed to make way for this thoroughfare. Rights-of-way cost $980,000, but the ground made usable through construction of the boulevard is estimated to be worth more than that amount paid.

The banks of the Kanawha being subject to rapid shifts and changes due to erosion, it was found necessary to build up and stabilize the river bank with heavy stone riprapping, said to be the largest improvement of this kind in existence. From the top of the riprap wall to the street level is a sodded terrace, providing a 5-mile stretch of green lawn from one end of the city to the other. Extending along and through it, a concrete sidewalk gives it the appearance of a well-planned park. Islands, sown in grass, are placed at intervals between the traffic lanes, providing convenient places for motorists to turn, and proving again that utility can be made a thing of beauty.

Stone for the "toe wall" to support the stone-surfaced bank was quarried a short distance up the Elk River, which cuts through the middle of Charleston and empties into the Kanawha. The toe wall required 106,000 cubic yards of rock fill, and 28,500 cubic yards of gravel were used for the foundation of the riprapping. The riprapping itself required 57,000 cubic yards of stone, and steps placed at intervals in it took 656 cubic yards more. Sand and gravel filling for the bank were taken directly from the river-bed by huge dredges, loaded into barges and towed by tugs to where needed.

The Kanawha Boulevard is lighted by sodium vapor lights, like those used on San Francisco's Golden Gate Bridge. The rays of the lights penetrate mist and fog, do not glare in the motorists' eyes, and thus add to travel safety on the new thoroughfare.

Following the same course as the old James River-Kanawha Turnpike, this "river road" was traveled by Daniel Boone in 1789, by George Washington when he rode by to survey lands in the West, by General Lewis and his men on their way to the Battle of Point Pleasant, and by Andrew aJckson when he came up from Tennessee in 1832. A mere "river road" no longer, Kanawha Boulevard is the accomplishment of Charleston citizens who, knowing that transportation facilities are the yardstick by which any city is measured, are looking to the needs of today and the demands of the future.

Buildings razed to make way for Kanawha Boulevard

Union Building is the only river-bank structure left since completion of Boulevard

Kanawha Boulevard from the south bank of the Kanawha River. *(See front cover)*

Sanitation Outside Cities

Survey of 2,077 Public Places on Main Highways Shows Need for Better Rural Health Administration

By RALPH T. FISHER
Sanitary Inspector,
New Jersey State
Department of Health

DURING 1939, inspectors of the Bureau of Local Health Administration of the State Department of Health of New Jersey inspected 2,077 rural public places, the majority of which were located on the main highways of the state. Many of them were in municipalities of over 2,500 population, usually considered by the Bureau of the Census as the limiting figure between "rural" and "urban" communities, but these places operated under rural sanitary conditions because of the absence of public water-supply and sewerage systems.

Chapter 261, Laws of 1939 of New Jersey, defines a "public place" as any establishment at which food is sold to the public, or water or toilet facilities are provided for public use. Food or drink was sold at 1,646 of the establishments inspected, or 79 per cent. Among the places inspected were 194 tourist homes, 141 groups of tourist cabins, and 9 trailer camps.

The establishments were located in 148 municipalities in 17 counties in the rural sections of New Jersey. Shore resort, lake resort, and highway establishments were inspected, constituting a representative sample of the rural public places in the state. The following table shows the distribution of the places inspected according to the population:

Population, 1930 Census	Number of Municipalities and Townships	Number of Public Places Inspected
Under 2,500	83	810
2,500 - 5,000	39	775
5,000 - 10,000	15	290
Over 10,000	11	202
Total	148	2,077

Insanitary conditions were found at 1,241 of the public places, or 60 per cent. These conditions ranged in seriousness from unprotected eating utensils to unsafe drinking water supplies and insanitary sewage disposal. The general condition of the buildings was found to be fairly satisfactory. Rooms were not well ventilated in 6 per cent of the food-vending establishments, rooms were not clean in 3 per cent, and counters and shelves were not clean in 4 per cent.

The Disposal of Sewage

Toilet facilities were provided in 89 per cent of the establishments inspected. Flush toilets were provided in only 69 per cent, and both flush toilets and privies were maintained in 8 per cent; a total of 1,414 places, or 77 per cent, having flush toilets for public use. Since 80 per cent of the places were in unsewered areas, the problem of the proper disposal of sewage is a serious one. Improper sewage disposal was found in 160 places, 14 per cent of all places having private disposal systems. The most serious violation that of sewage overflowing on the ground, was found in 87 places, or 8 per cent. Stream pollution was found on 20 premises.

There are two basic causes of improper sewage disposal at unsewered public places: first, the disposal system may be inadequate when installed; second, the disposal system may become inadequate when the business is expanded and the system is not enlarged to dispose of the increased load. These inspections clearly demonstrate the need for a more thorough regulation and control by local boards of health of the installation and maintenance of sewage-disposal systems at such public places.

Privies were maintained in 580 of the places and 65 per cent of them were found to be insanitary. While this is a large percentage, it is considerably better than conditions shown in previous surveys. Pits were not fly-tight in 41 per cent of the privies and 18 per cent were overflowing. These conditions show a definite need for a more rigid regulation and control by local boards of health of the installation and maintenance of privies at these public places.

Water Supplies

Drinking water was supplied to the public at 1,921, 92 per cent, of the places inspected. Of these, 57 per cent were from private supplies and 43 per cent from public water supplies. The private water supplies were secured from driven wells, 75 per cent; from dug wells, 24 per cent; and from springs, 1 per cent.

Bacteriological samples were collected from 563 of the private supplies. The supplies sampled were in the southern and central part of the state, and the results are not typical for the entire state. It has been the experience of the Department that private supplies in the northern area are more likely to be contaminated than those in the southern area, because of the difference in soil conditions. Bacteria of the Coli Aerogenes group were absent in 50 cc in 70 per cent

Health Menace to Motorists

The time of year is approaching when cities will be reporting "vacation typhoid" resulting from city folk spending their vacation at insanitary resorts or rural homes. This article dramatizes the situation in New Jersey, which is no worse than in the 47 other states, and shows the need for greater activity on the part of local boards of health in rural communities. It is a strong plea for increased activity among county boards of health and regional boards financed by several counties.

of the samples, present to the extent of 3 or less in 50 cc in 8 per cent, and present to the extent of more than 3 in 50 cc in 22 per cent.

A study was made of the physical conditions of 291 private water supplies used in public places in the central area of the state, and it was found that 31 per cent were open to contamination. This evidence indicates that at least 30 per cent of the private water supplies in use at public places do not meet present standards for public water supplies.

Dish Washing

Because of the difficulty of reliably determining the effectiveness of dish-washing methods with only one or two inspections, an effort was made to determine the adequacy of the dish-washing equipment as a measure of the effectiveness of the dish washing. Of 1,186 establishments having dishes or glassware to wash, 191, or 16 per cent, did not have the necessary equipment to supply an adequate amount of hot water and 44, or 4 per cent, did not have the necessary sinks and drainboards for washing dishes.

Dish washing is a public health problem which has not yet been squarely faced by most of the boards of health in New Jersey. Certain municipalities have secured improvement in the sanitation of eating utensils by specific regulations and routine inspections and enforcement. These efforts have been too scattered and too few to bring about any marked improvement in the state as a whole. The problem of insuring clean eating and drinking utensils, particularly at bars, has been recognized and studied by the State Department of Health and several local departments. A practical solution has not yet been agreed upon, nor has any method been widely adopted. The problem still remains.

Garbage Disposal

Many of the public places inspected are not in areas served by municipal garbage collection. In such circumstances, the disposal of garbage is the problem of each proprietor to be solved on his own initiative. Garbage was found to be improperly stored at 21 per cent of the food-vending establishments, and not properly disposed of at 6 per cent. Fly-breeding accumulation was found at 11 per cent and mosquito-breeding accumulation at 6 per cent of the places inspected.

Food Handling

Food-handling methods generally were found to meet minimum standards of sanitation. Only 5 establishments, or 0.3 per cent, did not have adequate refrigeration, and in 28, or 2 per cent, the refrigerators were not clean. In 26 places there were no hand-washing facilities for food handlers, and in 59 the clothing of food handlers was not clean. In 65 establishments, or 5 per cent, food was exposed to flies and dust. The majority of these were diners. In 6 per cent, eating utensils were exposed to flies and dust, and in 23 per cent, single service utensils were so exposed.

Need for Better Rural Health Administration

The common conception of the rural food-vending establishment as only a summer-time business is a fallacy. While the business of many places is seasonal, 85 per cent are open throughout the year. This survey has established the fact that rural public places present serious public health problems to local boards of health, particularly as regards unsafe water supplies and insanitary toilet facilities. At present, although the sanitary supervision of public places should be a function of the local board of health, the majority of rural boards are not meeting these problems, because of inadequate funds and insufficient personnel. This is further evidence of the need for larger local health units organized on the Regional Health Commission Plan in rural areas to provide such services on a full-time basis.

—From a paper presented at the Thirtieth Annual Conference of State and Local Health Officers of New Jersey.

Your Town's Old Buildings

THE growing concern of financial institutions with the pall of stagnation which has descended on some sections of most American cities is emphasized by the publication in the August issue of *Banking* of a discussion of this problem by municipal consultant Thomas H. Reed. Pointing out that the task is one in which local, state, and national governments can each render some effective assistance, but in which the initiative must come mainly from private enterprise, Dr. Reed says, in part:

"Reconstruction of deeply blighted areas can be carried on successfully only by large-scale operations based on sound planning and adequate financing. Something can be done, perhaps, by directing public housing projects into the blighted areas. Too often the elusive lure of cheap land takes them to the outskirts, only deepening the blight on the built-up portions of the city.

"When public housing has done its best, the major part of the job will still be left to be done by private enterprise. Inducements must be offered for large-scale projects. The right of eminent domain needs to be brought into play to circumvent greedy or obstinate owners. Otherwise, there will be no reasonable chance of assembling large and compact tracts. A partial exemption from taxation, covering the new value added to property by reconstruction or remodeling, might well be added as a further inducement. On the other side, private corporations with such powers should be subject to regulation as to their plans and financial operations.

"This does not cover the whole story. There are other things that need to be done by government on all its levels, by capital as represented by banks and insurance companies, by the enterprise of material men and contractors, and by organized labor. Private enterprise housing is caught in a net as intricate as that which reduced to helplessness the lion of Aesop's fable. It cannot break out by main strength. There has got to be patient cutting of the strands, one by one. There is need of better planning and zoning. Restrictions must be placed on premature suburban subdivision. Building codes need modernization. Labor-employer-material men rackets need to be suppressed. A faulty wage policy, with emphasis on rates rather than on earnings, needs to be replaced by a sound policy that will give labor jobs and contractors contracts."

By economical modern practice

Putting Wires Underground—II

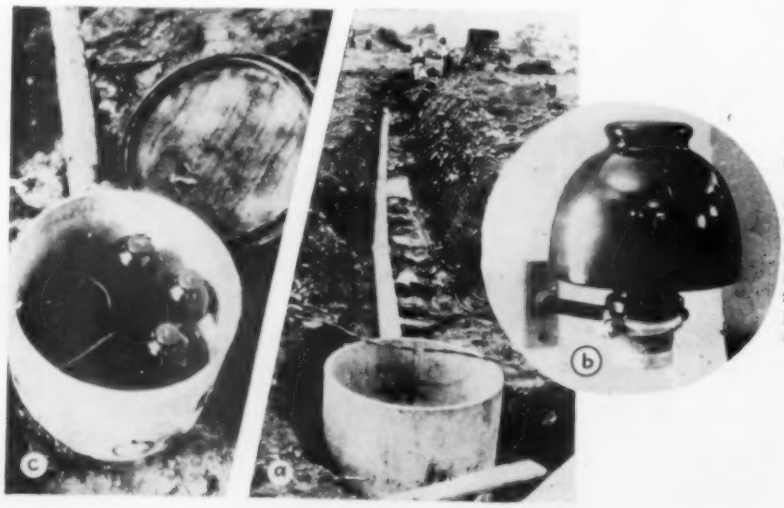
By Ray Blain
Engineer, Signal Corps, U. S. Army

PRACTICALLY everyone will agree that the placing of electric power and light, telephone, signal and fire-alarm lines underground in any town or city is desirable, the only objection being the cost involved. While it is true that the initial cost of underground construction for these services is somewhat higher than for aerial plant, it is likewise true that the maintenance cost of the underground plant is considerably less, and this saving spread over a period of ten or fifteen years may prove the underground plant the better investment. Underground plant is also less subject to service interruptions, which is certainly a most important consideration in this age of speed and high pressure. In this article, an attempt will be made to describe briefly how an underground system may be planned and constructed economically.

Where the entire plant cannot be placed underground, that part in the congested business district certainly should be buried. This should include power and light, street lighting, telephone, traffic signals and fire alarm. One duct structure with separate manholes may often be used to advantage for these combined services. When a combined duct structure is not desired or possible, then two structures, one for power and light and one for signal cables, can often be used. Ducts carrying light and power cables should be separated from signal cables by at least 3 inches of concrete or 12 inches of earth. All other foreign structures, such as gas or oil mains, should be cleared by at least 6 inches of earth by both power and signal underground conduits.

Signal cables should never be run through the same manholes with power cables. When duct structures for all services are placed in one trench, either a two-compartment manhole should be used or two manholes separated by a few feet of earth. The conduit may all be placed in the same trench and the two groups separated "Y" fashion to connect to the two manholes. Cable should not ordinarily be placed in the same trench with water or gas pipes of any kind. When telephone, fire-alarm and signal cables are racked in the same manhole, they should be identified by suitable metal-tag markers. The painting of cables in different colors for identification purposes is not considered good practice, since the moisture usually present in manholes causes paint to scale.

Manhole construction need not be either expensive or difficult if modern methods are used. Formerly, manholes were constructed of brick with arched roofs, which was both slow and expensive. Concrete is now used almost entirely for modern manhole construction, and is not only better and cheaper but very much quicker. The construction of this type of manhole is also greatly facilitated by the use of sectional steel forms and ready-mixed concrete. This concrete is now available in all large cities and many towns and villages. Its use will usually prove much cheaper than mixing either with a machine or by hand in small quantities at each manhole location. The ready-mixed concrete is also usually delivered in mixer-type trucks, which makes it especially suited for manhole construction. The sectional-steel manhole forms require only a hammer and one man to set up and dismantle. The steel sections are comparatively small and may be easily passed out through the small roof opening, which permits the pouring of the complete manhole, roof and all, as a unit. The mistake should never be made of constructing manholes too small, for the crowding of cables or apparatus in them never proves satisfactory. The difference in the cost between a small and a large manhole is so slight that the saving is negligible. The smallest manhole to be tolerated in most cases on sig-



By use of Johns-Manville 4-inch Transite duct and the 24-inch Transite service handholes shown here, the Belmont, Mass., Light Department held down costs of its new secondary distribution lines in (a) 18 x 18-inch trench. Customers' 3-wire services are tapped from General Cable fixtures (b) protected by small diving bells and mounted in 24 x 24-inch handholes (c) having a capacity for seven services. This underground construction is said to have cost only $20 per lot more than overhead would have cost

nal-system main runs should be 3 x 4 feet with 5 feet headroom. On laterals and for distribution in residential sections smaller manholes or pull-boxes are often used to advantage. A common size which has proved satisfactory for this purpose is 22 x 40-inch and about 3 feet deep, with a full-opening square cover. Considerable success has been attained in the use of a precast concrete manhole fabricated in large numbers at some central location and then transported and set in a hole previously dug for the purpose on the underground conduit run. Some type of winch and derrick mounted on a truck is usually required for handling and installing this manhole.

The type of conduit to use will depend on the location and number of ducts. The materials most commonly used are vitrified clay (single for power and telephone; multiple clay for telephone and occasionally for power cables); creosoted wood, fiber and asbestos-cement (Transite conduit). Wrought-iron pipe is used occasionally for special purposes on short runs, and wrought-iron bends are often used to connect to the various types of conduit for a riser pipe when it is necessary to bring a cable from the underground for terminating on a pole or building. Clay conduit comes in 2- or 3-foot sections, creosoted wood in random lengths 2 to 6 feet; fiber in 8-foot, and asbestos-cement in 10-foot lengths. Any material that has the necessary strength, corrosion resistance, inertness, immunity to electrolysis, is non-inductive, will not harm cable sheath, and has a low coefficient of friction, may be successfully used for a modern conduit system. Clay conduit is joined with dowel pins, then the joint is wrapped with cheese-cloth and plastered with cement mortar. Ordinarily, no plaster or cement of any kind is used in the joints of creosoted wood. Joint sealing compound is occasionally used on fiber and asbestos-cement duct, although these joints are accurately machined and this precaution is usually considered unnecessary. The fiber manufacturers recommend against the use of jointing compounds on their product.

Clay conduit is generally installed without a concrete envelope or any additional protection. Occasionally, however, in very soft soil, a creosoted plank or concrete base is provided and a top protection may sometimes be used in special cases where additional protection may prove desirable. Creosoted wood is designed for installation without extra protection of any kind. Fiber and cement-asbestos may be installed either with or without a concrete envelope. When the concrete covering is used, a special type of these conduits with thinner walls is recommended.

The opinions of construction men differ considerably as to the depth to which conduit should be installed, but a safe rule to follow is to dig the trench to a depth that will permit a covering of 2 feet of earth over the top of the duct structure. The bottom of the trench should also be graded so that it will have a fall of at least 3 inches in 100 feet from a central point in a section to each manhole or from one manhole to another to provide adequate drainage for the ducts. The ducts should enter manholes at a level which will permit a splicer to work on cables comfortably without the need of standing on a box or ladder.

In new adidtions where other utilities have not yet been installed or where their location is accurately known, trench for conduit may be quickly and cheaply dug with a machine. In congested districts and where other utilities may interfere, the pick-and-shovel method may prove most desirable. Air hammers and the newly developed gasoline-operated hammer may be used to advantage in pavement cutting and retamping. Often concrete paved streets may be tunneled whole or in part for conduit runs to avoid cutting the surface. Special machinery can also be used for backfilling and tamping to reduce the cost of underground construction.

For further details on the advantages of underground construction, in residential districts too, and on streamlining the overhead in case you absolutely cannot go underground at once, see pages 42 and 43 of the August issue of THE AMERICAN CITY, which graphically illustrates some of these.

Schools Defend American Way

To the Editor of THE AMERICAN CITY:

Democracy calls desperately for a courageous, intelligent and adequate direct dealing with the specific problems which citizens face in the public life of the community, the nation, and the world. Recognizing this fact, the New York State Council of School Superintendents, at its annual meeting at Saranac Inn last fall, decided to do something about it.

With the advisory assistance of an expert provided by the State Department of Education, and a forum counselor made available by the United States Office of Education, a committee of the school administrators traveled some 15,000 miles throughout the state urging that men and women in a democracy must rise to defend the American Way, and that they must do it in an intelligent democratic manner. The committee issued a monthly bulletin to serve as a clearing-house and a center of information describing techniques and methods for setting up effective discussion groups that would encourage public participation.

These efforts were not without fruit. Within ten months nearly twenty communities organized discussion groups; two state-wide conferences were held. Fifteen prominent organizations (labor, school, college, city, radio, women's groups, etc.) cooperated with the committee to launch as many research projects investigating the degree of democracy existing in various areas of our public life. The Summer Institute on Forums and Public Affairs held at Brockport Normal School in August was a product of the superintendents' work. By means of a survey, the committee now has a list of 643 qualified discussion leaders to be used as a source by organizations desiring their service.

Radio, too, has responded to the call of the committee. Five radio stations in various sections of the state will carry the recordings of the "Empire State Town Meeting of the Air" broadcast from Union College every Sunday afternoon. The New York Broadcasting Company network of nine stations is carrying the Committee's weekly New York State Roundtable, made possible by the cooperation of the New York State League of Women Voters, The Service Bureau for Intercultural Education, and the Citizens Union of New York City. Stations at Ithaca, Troy, Poughkeepsie, Kingston, Syracuse and elsewhere have offered radio time for this important purpose.

In this manner the school superintendents are leading the procession in defense of the American Way. They are encouraged by the cooperation and volunteer assistance received from energetic men and women in every walk of life.

FREDERICK L. HIPP,
State Forum Counselor, Committee on Adult Civic Education,
107 Union Street, Schenectady, N. Y.

Large Sewer Program in Cranston, R. I.

First Year of Work Combining WPA Labor with Large Purchases of Equipment by City

By ELTON F. DURFEE
Commissioner of Public Works

A $6,000,000 project to install 89 miles of trunk-line and lateral sewers, ranging from 8-inch to 42-inch, with about 30 miles of house services connecting the mains to the property lines, was started on June 5, 1939, by the city of Cranston. This city of 50,000 people is undertaking to install this complete sewer system, combining a WPA work relief program with the equipment and the material furnished by the city. The WPA's share of the cost is about $3,500,000, and the city's share approximately $2,500,000.

A three-man commission was appointed by the City Council, consisting of Everett W. Higson, Chairman, James McMaster and Leslie Ballou. Mr. McMaster died April 24, 1940, and John McGuigan was appointed to fill the vacancy. Fay, Spofford & Thorndike, of Boston, Mass., were employed as consulting engineers, and the Commissioner of Public Works was placed in charge of the supervision and operation of equipment.

A large part of the equipment formerly owned by the Department of Public Works was transferred to the Sewer Commission and included:

- 1 Erie Type-B steam crane
- 3 Erie Type-B steam shovels
- 2 Little Wonder concrete mixers
- 7 5-ton Mack trucks
- 2 steam rollers
- 1 Lorain-40 gas shovel

Most of the steam equipment has since been replaced with gas-powered equipment. At the outset of the work, the Sewer Commission purchased three Lorain 40-A shovels, equipped with back-hoe attachments, and three Lorain 40-A cranes, equipped with a hoist interchangeable with back-hoes, one P & H mobile crane unit and two Buckeye Model-120 trench digging machines.

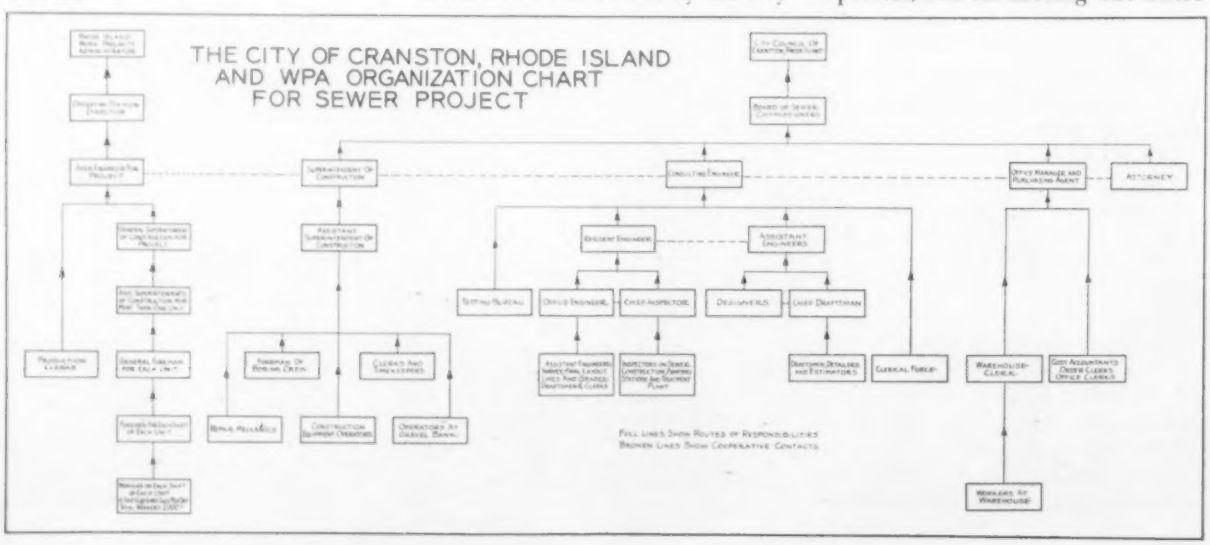
Later in the year, purchase was made of two more Lorain-40 convertible back-hoe shovels and cranes, two Lorain 40-A gas shovels, two TD-35 International crawler tractors, one with a bulldozer and the other with a Hough high-lift shovel, two Model I-40 International tractors with rubber tires and rigged with a tripod for pulling sheathing.

A warehouse was built for storing lumber and supplies on property located on a railroad siding leased by the Commission. A crusher and bin owned by the city were completely rebuilt with new screens and bins, and the city purchased a 17-acre gravel bank from which to produce crushed stone, gravel and sand for repair and underdrain work.

In addition, the following equipment was added to speed construction:

- 2 Schramm 105-cubic-foot air compressors
- 1 Chicago-Pneumatic 210-cubic-foot air compressor
- 2 Worthington 210-cubic-foot air compressors
- 5 Worthington 105-cubic-foot air compressors
- 3 Jaeger 4-inch self-priming pumps
- 2 Jaeger 2-inch self-priming pumps
- 1 Marlow 3-inch self-priming pump
- 11 Gorman-Rupp 4-inch self-priming pumps
- 2 Domestic 4-inch diaphram pumps
- 2 Gorman-Rupp 6-inch self-priming pumps
- 29 Chicago-Pneumatic sheathing hammers
- 14 Ingersoll-Rand 3-inch sheathing drivers
- 1 Moretrench wellpoint outfit complete for 150 feet of trench
- 1 Gorman-Rupp 3-inch self-priming pump

For the use of supervisors, inspectors, and for moving dirt where



Typical Construction Equipment Used in Cranston, R. I., Sewer Construction

necessary, the following automotive equipment was purchased:

1 Plymouth coupé
1 Chevrolet coupé
1 Ford coupé
2 Ford ½-ton pick-up trucks
1 Chevrolet 1½-ton pick-up truck
2 Ford 1½-ton pick-up trucks
11 Ford 3-ton dump-trucks

In the municipal garage owned by the Public Works Department of the city, a complete blacksmith shop with power hammer, power lathe, grinding machines and a welding outfit was set up to service equipment. Hotchkiss steel forms were purchased from the Binghamton Metal Form Co. for the construction of concrete manholes.

The latest purchases of the Commission include five Model 27 Lorain shovels equipped with backfillers for backfilling trenches and an 8-ton tandem roller for resurfacing the trenches. A large quantity of minor equipment and tools necessary for carrying on construction work was also purchased.

Operation

The WPA started with approximately 600 laborers on the project and gradually increased the number as rapidly as new sections were opened, until now about 2,600 laborers are used. The work was carried on during the first few months with two 6-hour shifts. About February, 1940, the entire program was placed on a 24-hour basis with four 6-hour shifts. Poles and electric wiring were strung along the streets and connected to the lines of the Narragansett Electric Lighting Co. to furnish lights for night work. Most of the equipment owned by the Sewer Commission is operated on three 8-hour shifts.

At the end of the first year of work there had been installed 30 miles of trunk line and 11 miles of house-service connections. The operation generally consists of the back-hoes and trenching machine opening and digging the trench down to a depth where the bank would indicate a tendency to cave in. Sheathing is then placed, and a crane with a clamshell bucket completes the excavation as the sheathing is driven down.

After the house connections have been installed and the backfill compacted the high-lift shovel is sent to re-excavate the top of the trench to a proper depth of resurfacing. Stone from the crushing plant is used for the base, and small stone and sand sent from the crushing plant are mixed by power shovel at the rate of 20 gallons of 70-viscosity Koppers tar per cubic yard and placed at a depth of 2 inches over the foundation for a temporary surface.

A Live and Useful Forum

TALLADEGA, ALA.—Citizens of Talladega are making definite progress in the direction of economic and cultural betterment through their Town Forum, a non-political, non-sectarian citizens' organization established last October.

Following a two-day Town Building Institute conducted last fall with the assistance of R. C. Morrison, Director of Holland's Southern Institute for Town Service, of Dallas, Texas, a Town Forum Council was set up. The Council consists of presidents and secretaries of all existing civic, service and religious organizations and 18 citizens at large, including farmers and farm women. The Council elected officers, who serve as an executive committee, guiding the work of the Forum and coordinating the work of the committees. The committees fill gaps not filled by committees of other organizations and the Forum as a whole attempts to assist other organizations in carrying out worth-while projects.

The first definite result of the Forum was the development of a town spirit which has individuals and organizations working together on vital community problems better than ever before. Besides serving as an impetus to progressive action through town unity, the Forum serves as a coordinating agency for the study and solution of town problems.

Small neighborhood discussion groups provide everyone with an opportunity to express his views, to advance ideas and to participate in study and discussion of town problems. When nearly all the discussion groups reported a need for supervised recreation for children and young adults, the Forum raised funds through the presentation of a "Recreation Revue" and employed a physical education director to supervise a town-wide recreation program during the summer months.

Direct and indirect results of the new town interest stimulated in Talladega include: reorganization of the Garden Club; establishment of a County Historical Society; widening the scope of the character-building program in the public schools; solution of an auto parking problem in the business district by cooperation (without benefit of new traffic ordinances); setting-up of committees to finance a summer camp for underprivileged boys, and arranging for a center for visitors to Talladega in the Court-House.

The Chamber of Commerce, which has worked hand-in-hand with Forum officials, is enlisting the interest of citizens who are not members of the Chamber of Commerce in efforts to improve business conditions. Business, civic, religious and political leaders are cooperating to make Talladega a better and more prosperous town.

CECIL HORNADY,
Sec., Talladega Chamber of Commerce.

1,500 *Talladega residents came to a Town Hall meeting on May* 10

Lund, Nev., is now an oasis that sparkles at night with diesel electric lights

Hamlets Boomed by Pocket Diesels

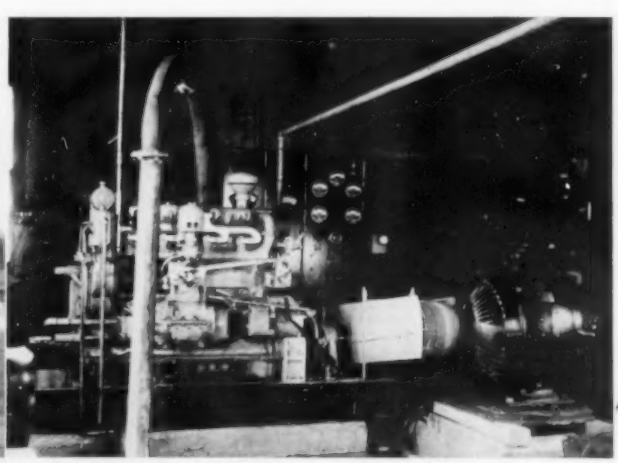
THROUGHOUT Nevada, Utah, and other sparsely settled states, where there is awesome scenery and few to see it, centuries of erosion have created fertile little pockets between the ranges of barren, snow-covered mountains. Here and there villages have sprung up. Many of them have not more than 150 inhabitants, yet ranchers and prospectors from miles around go to them for supplies and mail.

Two years ago these places seemed to be a century behind the times. Something has waked them. Electric signs are sprouting along Main Street; residences are electric-lighted. A modest industry is making each community more self-sufficient. Poles and wire are going up; carloads of electrical equipment — refrigerators, fans, heaters, irons, toasters, lamps—are rolling out across the mountains. Merchants are carrying light globes and all kinds of electric kitchen equipment.

Lund, Nev., as an example, nestles at the base of a sweeping rise of mountains. The traveler on Route 6 sees it miles away. From year to year things changed very little, until Udell Gardner created the Lund Light and Power Co.

Into Lund, on December 10, 1940, rolled a complete power plant in a crate. The 4-cylinder Caterpillar diesel engine, directly coupled to a 440-volt, three-phase generator, is self-regulating, and Mr. Gardner set out to find customers. Soon he had 35 residences, the school and two business houses, with a cold storage plant and creamery and a flour mill in prospect.

These self-contained plants, both municipal and private, are on the increase. They immediately place the sagebrush towns more nearly on a par with larger communities. They make restaurants sparkle, boom filling-station business, lighten the routine burdens of the residents. The 40-kw plant at Orderville, Utah, for instance, serves the lights of 80 families, at an average operating cost of 24 cents per hour.



Left—McCall, Idaho, is now a summer resort with street lights fed by diesel electrics. Right—Interior of the Hope, N. Dak., municipal light and power plant, whose Caterpillar diesel driving a 45-kw Fairbanks-Morse generator is using 2 gallons of 7.8-cent fuel oil per 20-hour day

Seven Years' Operation Data, Grand Rapids Sewage Works

Prepared from Ninth Annual Report of the Treatment Works Division, Public Service Department

THE sewage-treatment plant at Grand Rapids, Mich., is a primary treatment plant with the removed solids treated in separate digestion tanks and dried on open beds. The entire cities of Grand Rapids and East Grand Rapids, comprising a total of 26.8 square miles, are served by these works. The combined connected population of the two communities is estimated at 174,500 for Grand Rapids and 4,100 for East Grand Rapids.

The designed capacity of the plant is 32.5 mgd, sufficient to treat the sewage contribution of 250,000 people, which is the estimated population of the two cities in 1954. The plant is located on a park-like tract of land, owned by the city

SUMMARY OF OPERATING RESULTS 1932–1939 GRAND RAPIDS, MICH., SEWAGE-TREATMENT PLANT

	1932–3	1933–4	1934–5	1935–6	1936–7	1937–8	1938–9
Population							
Estimated connected—Grand Rapids	170,170	171,879	171,879	171,879	174,500	174,500	174,500
Estimated connected—E. Grand Rapids	4,080	4,121	4,121	4,121	4,100	4,100	4,100
Estimated connected—Total	174,250	176,000	176,000	176,000	178,600	178,600	178,600
Sewage							
Total m.g. treated	8,581.3	9,397.2	9,095.0	10,340.8	9,882.2	10,300.7	9,705.9
M.g. treated per day	23.5	25.8	24.9	28.2	27.1	28.2	26.6
Gals. treated per capita per day	134.9	146.6	141.5	160.2	151.6	157.9	148.9
Retention period in clarifier—hrs.	2.02	1.84	1.91	1.70	1.77	1.67	1.80
Screenings							
Total cu. ft. removed	5,215.0	6,699.0	5,809.0	5,213.0	6,224.0	8,398.0	6,615.0
Cu. ft. removed per m.g. treated	0.61	0.71	0.64	0.50	0.63	0.82	0.68
Grit							
Total cu. ft. removed	33,570.0	46,668.0	47,187.0	45,408.0	50,679.0	61,707.0	43,158.0
Cu. ft. removed per m.g. treated	3.9	4.9	5.2	4.4	5.1	6.0	4.4
Per cent organic matter	41.5	41.5	43.6	35.8	35.5	28.4	27.3
B. O. D.							
5-day—lbs. per cap. per day—inf.	0.175	0.239	0.247	0.188	0.171	0.166	0.107
5-day—lbs. per cap. per day—eff.	0.112	0.161	0.163	0.125	0.108	0.109	0.072
Per cent reduction in B. O. D.	35.9	33.4	34.0	34.8	36.8	34.2	32.2
Suspended solids							
Per cent removal	53.7	50.0	50.6	47.8	46.6	46.8	48.9
Lbs. dry solids removed per m.g. treated	792.0	759.0	784.6	648.9	683.1	649.7	691.4
Lbs. dry solids removed per cap. per day	0.11	0.11	0.11	0.10	0.10	0.10	0.10
Tons dry solids removed	3,398.2	3,573.4	3,566.0	3,355.0	3,375.3	3,346.4	3,355.3
Tons dry solids daily—influent	17.34	19.36	19.31	19.10	19.87	19.61	18.72
Tons dry solids removed daily	9.31	9.79	9.77	9.15	9.26	9.18	9.19
Tons dry solids to river	8.03	9.57	9.54	9.95	10.61	10.43	9.53
Raw sludge							
Total m.g. removed	17.42	28.18	27.33	24.81	23.39	24.31	22.28
Gallons per day	47,713	77,198	74,884	68,346	64,084	67,118	66,043
Gallons per m.g. sewage treated	2,030	2,999	3,005	2,420	2,367	2,360	2,296
Gallons per capita per day	0.27	0.44	0.43	0.39	0.36	0.38	0.34
Tons dry solids per day	8.15	14.48	15.30	15.08	12.27	13.10	10.93
Tons dry solids per year	2,974.8	5,285.2	5,584.5	5,504.2	4,478.6	4,764.6	3,990.3
Lbs. dry solids per m.g. treated	694.0	1,125.1	1,228.6	1,069.0	905.5	910.3	822.3
Lbs. dry solids per capita per day	0.094	0.170	0.170	0.171	0.137	0.147	0.122
Lbs. available vol. matter per m.g.	498.3	765.0	834.2	717.0	607.6	601.7	577.3
Per cent red. in avail. vol. matter	59.8	53.5	51.2	51.5	53.1	52.5	60.5
Lbs. red. of vol. matter per m.g.	298.0	409.0	427.1	369.8	322.6	315.7	349.3
Lbs. dry solids to digesters per month per cu. ft. capacity (basis of four digesters)	1.29	2.29	2.42	2.39	1.94	2.06	1.73
Digested sludge							
Total m.g. removed	4.84	6.02	8.07	6.05	5.20	4.68	5.09
Gals. per day	13,273	16,500	22,112	16,680	14,238	12,855	13,932
Gals. per m. g. sewage treated	564.5	640.7	887.4	591.0	525.9	444.8	523.9
Gals. per capita per day	0.08	0.09	0.13	0.10	0.08	0.07	0.08
Tons dry solids per year	1,898.3	2,058.6	2,590.6	1,919.0	1,754.3	1,736.3	1,990.3
Tons dry solids per day	5.20	5.64	7.10	5.26	4.81	4.76	5.45
Lbs. dry solids per m. g. treated	442.6	437.2	570.1	373.0	355.0	329.1	410.2
Lbs. dry solids per capita per day	0.060	0.064	0.081	0.060	0.054	0.053	0.061
Gas production							
Total million cu. ft.	52.64	50.69	58.22	47.48	47.64	50.08	55.43
Cu. ft. per day	144,217	138,700	159,412	129,665	130,517	138,423	151,869
Cu. ft. per capita per day	0.828	0.785	0.910	0.740	0.731	0.775	0.850
Cu. ft. per m.g. treated	6,137	5,376	6,402	4,598	4,821	4,790	5,711
Cu. ft. per lb. dry solids added	8.8	4.8	5.2	4.3	5.3	5.3	6.9
Cu. ft. per lb. vol. solids added	12.3	7.0	7.7	6.4	7.9	8.0	9.8
Cu. ft. per lb. vol. solids digested	20.6	13.1	15.0	12.5	14.9	15.2	16.2
Cu. ft. per lb. susp. solids—influent	4.2	3.6	4.1	3.4	3.3	3.4	4.1
Cu. ft. per lb. susp. solids removed	7.8	7.1	8.2	7.1	7.0	7.4	8.3
Costs							
Net cost of operation	$50,223.80	$42,549.58	$43,256.19	$43,783.49	$52,010.67	$56,237.62	$30,829.96
Per m.g. sewage treated	5.85	4.53	4.76	4.23	5.26	5.46	3.18
Per wet ton sewage treated	1.4 mills	1.1 mills	1.1 mills	1.0 mills	1.3 mills	1.3 mills	0.8 mills
Per m.g. raw sludge	$2,883.11	$1,509.92	$1,582.74	$1,764.54	$2,223.63	$2,313.35	$1,383.75
Per m.g. digested sludge	10,366.11	7,066.86	5,360.12	7,234.55	10,002.05	12,016.59	6,056.97
Per dry ton raw sludge	16.88	8.05	7.75	7.95	11.61	11.80	7.73
Per dry ton digested sludge	26.46	19.65	16.70	22.82	29.65	32.39	15.49
Per capita per year	28.8¢	23.9¢	24.6¢	24.9¢	29.1¢	31.5¢	17.3¢
Per capita per month	2.4¢	2.0¢	2.1¢	2.1¢	2.4¢	2.6¢	1.4¢
Per day	$137.60	$116.57	$118.51	$119.95	$142.49	$154.08	$84.47
Per $1,000 assessed valuation	.21	.23	.23	.24	.28	.30	.16

and comprising approximately 100 acres.

Sewerage System

The sewerage system of Grand Rapids is largely on the combined plan, while that of East Grand Rapids is entirely a separate system. Grand Rapids has 175 miles of combined sewers and 113 miles of separate sanitary sewers, while East Grand Rapids has approximately 30 miles of sanitary sewers, making a total contributing system of approximately 318 miles.

Grand Rapids sewage is strictly domestic at the present time. The industrial waste is negligible, owing to the high dilution of the combined sewers. Approximately 74 per cent of the sewage must be pumped to the treatment works through the Market Avenue pumping station.

The actual construction of the sewage-treatment works at Grand Rapids began in July, 1929, and was completed in March, 1931.

The tables on the opposite page give a complete picture of the operating results at the Grand Rapids plant for the past seven years.

New England Survey Aids Planning and Defense

AN extremely accurate geodetic survey, of vital importance to improved regional and urban planning as well as defense of the strategic New England area, is now under way in Bridgeport, Conn.

This survey, of the self-perpetuating type, is being operated with the assistance of the Work Projects Administration, and is under the sponsorship of the Bridgeport City Engineer's Office. Horizontal and vertical control with reference stations at frequent intervals will be established over the entire city area. From this network the survey will carry on to determine accurate locations of boundary and property lines. Block, property and contour maps of the entire city will follow.

The triangulation net or city web of basic positions is now virtually complete. The system of traverse lines which breaks down the triangulation net into more closely spaced stations or reference points, used in determining the accurate location of streets, buildings, and physical features, is now in progress. Vertical control, or the line of levels which will determine elevations and serve as a basis for contours of the Bridgeport area, is likewise under way. The whole city scheme will be tied in with the national system of horizontal and vertical control which the Coast and Geodetic Survey has been establishing for many years.

This national system of triangulation arcs is to the nation what a triangulation net is to a city. It must be further broken down into closer spaced reference points of location before widespread local use is possible.

Value to Bridgeport

The value of this work to the city of Bridgeport can hardly be estimated, for, like a great many other cities of its size, it has never had an accurate survey or system of maps. The positioning of property lines, boundaries, streets, and underground structures will greatly facilitate property valuation and city planning. Expansion of the city and of public works can now proceed in a systematic manner. The use of contour maps, which will be made upon completion of the vertical survey, will greatly aid in advantageous locating of new streets, roads, and underground utilities.

The concentration in this city and in the New England area of a number of industries now vital to defense production, together with naval and submarine bases along the coast, has further accentuated the survey's value. Accurate military planning and mapping depend to a large extent upon accurate surveying. The coordinate system of reference locations, used in this survey, is readily adaptable to the accurate spotting of details on aerial photographs. And with Bridgeport's WPA survey tied in with similar work, completed or under way in the New England area, wide military use will be possible.

City surveying has made rapid strides in the last ten years. Boston, Cleveland, Minneapolis, Pittsburgh, Denver, and many other large cities have carried out accurate surveys in the last few years with WPA aid. These surveys have all conformed with the specifications adopted by the American Society of Civil Engineers in 1934.

Owing to the density of structures and the higher values of city areas, it is obvious that surveys within urban areas must have a higher accuracy than those over less populated regions. The extending of the triangulation system over the entire city area, the spotting of reference points of locations at closer intervals, and the carrying of the survey down to the street and property markers, has caused such work to be sometimes called a net survey of a city area.

Far-seeing engineers hope eventually to see the entire country so surveyed that accurately located reference markers will dot the nation at intervals sufficiently adequate for practical application. When this national plan is consummated, both local and national planning will be greatly enhanced. The difficulty in getting laymen to understand the technical aspects and the importance of geodetic surveying has been one reason, perhaps, that more of this work has not been done.

How Geodetic Surveying Works

Geodetic surveying, in general, establishes fixed coordinated points of latitude and longitude at convenient intervals, or fixes points on the earth with relation to the fixed or immovable stars. A standard reference system is thus used so that all points will be accurately located with reference to each other.

Each geodetic control station, located reference point, or boundary line, is thus established with relation to all other surveyed points within the national scheme. This as a whole is based upon one nationally assumed datum or starting point. For the North American continent this datum or origin is set at Meades Ranch in Kansas, a point of accurately determined latitude and longitude. This means that over the nation the same system is used, each point or each area is tied in with every other surveyed point or area. Accuracy and standardization results.

Modern geodetic surveying uses a mathematical system of plane coordinates, established for each state by the Coast and Geodetic Survey. Each reference point determined by this method is thus established within a mathematical framework of X and Y coordinates. These X and Y coordinates permit easier calculations, but still can be translated into terms of latitude and longitude if desired.

Within the modern survey system, each control station or marker of location carries X and Y coordinates, and distances and directions to other stations. So if the marker of any determined station or located point is lost it can readily be relocated on the ground by its mathematical relationship to other points within the system. This provides a certain element of self-perpetuation of such a survey once it is accurately made.

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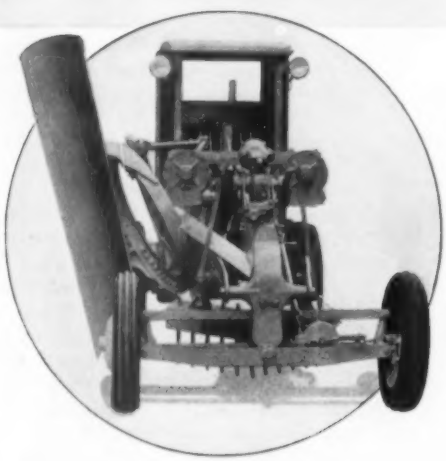

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Garbage Disposal

Comparative Costs and a Discussion of Grinding as Practiced in St. Louis — Collection Data

THE grinding of a major portion of the garbage collected in St. Louis has been practiced for halfa decade, as was outlined in an article in THE AMERICAN CITY, June, 1938. In 1935, experiments were started with a hammermill of special design, to see what could be accomplished with grinding garbage. Preliminary tests were successful, since there were no odors and no deposits in the sewers, and the Mississippi River two miles away had ample volume at sufficient velocity to carry away the residue, resembling a thick soup. City garbage averages 80 per cent water, and the stream pollution from this source was believed to be negligible as compared with the pollution from sewage.

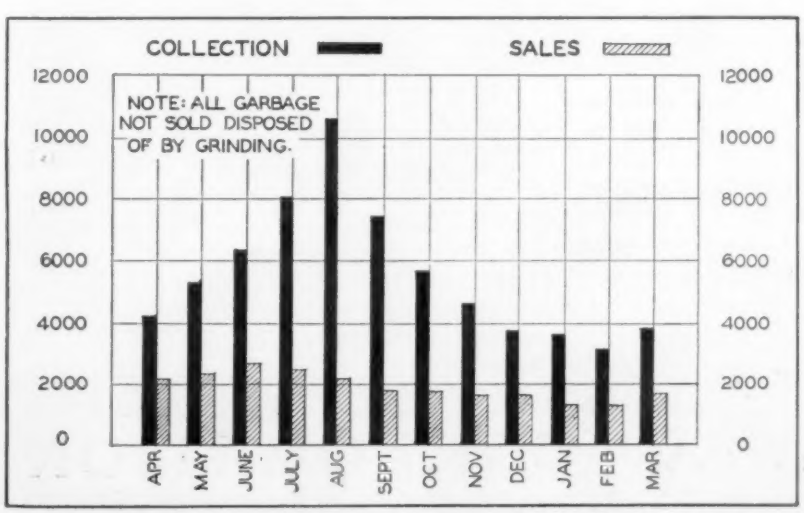
The War Department, which has charge of all navigable streams, was consulted by the Department of Streets and Sewers of St. Louis, and, at its request, the Bureau of Fisheries made tests to determine the B.O.D. value of the garbage and also the dissolved oxygen content of river water, both above and below the harbor. The report indicated that the condition was from "adverse to critical" with regard to the oxygen required to support aquatic life. The Mississippi River is of prime importance commercially, and the finny inhabitants of it are largely scavengers.

After some delay, St. Louis secured a letter of approval from the War Department permitting it to continue and enlarge its program of garbage grinding and disposal in the river. Another grinder was purchased immediately, and the first plant was constructed with receiving hoppers and conveyors, having a rated capacity of 30 tons per hour. Certain changes in the design were made which permitted doubling this capacity shortly thereafter. The plant, costing $40,000, was paid for from funds in the department budget and was ready for operation when the hog-farm contract expired February 19, 1935.

Current Operations

In his annual report for the fiscal year 1938-1939, Frank J. McDevitt, Director of Streets and Sewers, points out that garbage cannot be stored like coal or crushed stone; it must be ground as collected. As no reserve capacity was available, it was necessary to build another plant for grinding St. Louis' garbage, and this was completed the following year. The second plant has a capacity of 40 tons per hour and cost $10,000 more, owing to some improvements in design, and to the fact that the property needed for the site was less expensive. Both plants have been paid for by savings obtained through what would have been paid to hog-farm contractors under the old system of disposal. Operating and maintenance costs have been low, so that the new method of disposal, after five years' operation, is termed satisfactory and economical by St. Louis officials.

The tabulation (p. 71) gives costs of collection and disposal in St. Louis as compared to three other large cities in the United States.



Collection and Sale of Garbage in Tons per Month, April, 1938—April, 1939, in St. Louis, Mo.

Collection in St. Louis

During the past few years mule-drawn teams have been discarded in St. Louis in favor of modern trucks with fully enclosed sanitary bodies. Records are not entirely clear as to the number of wagons formerly used, but the estimate is from 150 to 200, depending on the season. Each team had a collector who was paid $115 per month by the city.

Each collector had a helper called a "fox," whose pay was what tips he could collect, and as an additional incentive he could have first pick of the garbage to take home for food. This practice was stopped immediately by the city after it took over all collections, and after a couple of years authority was secured by ordinance to put thirty of these men on the payroll as laborers at $3.50 per day.

At present the city is divided into two parts for collection, and each half has forty routes. Collections are made alternately in the north and south sections three times a week. Each collection truck

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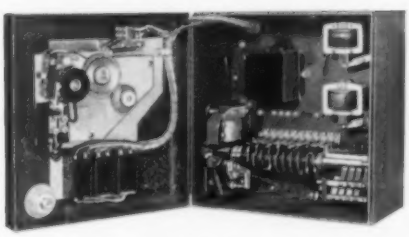

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COMPARATIVE GARBAGE COLLECTION AND DISPOSAL COSTS IN FOUR LARGE CITIES

	Milwaukee Area 44 Square Miles Population 625,000 14,000 per Square Mile	St. Louis Area 63 Square Miles Population 850,000 13,500 per Square Mile	Baltimore Area 92 Square Miles Population 850,000 9,240 per Square Mile	Los Angeles Area 450 Square Miles (see note below)
Total net expenditure	$391,238.28	$219,321.53	$275,184.01	$534,799.00
Cost of collection	$267,914.85	$220,958.19	.....	.....
Number of loads	42,024	21,822	28,000	61,617
Average weight per load in pounds	2,273	6,082	5,730	6,195
Total annual tonnage	47,763	66,359	80,220	190,953
Cost per capita	$ 0.428	$ 0.259	$ 0.323	$ 0.411
Cost per square mile	$ 6,088.95	$ 3,507.27	$ 3,024.00	$ 2,785.40
Pounds of garbage per capita per year	184	156	188	294
Receipts from sale of garbage, fees and power	$ 11,730.79	$ 20,401.15	.....	$112,296.00
Total net cost of disposal	$123,323.43	$ 18,764.49	$152,190.06	.....
Gross cost per capita	$ 0.216	$ 0.022	$ 0.179	.....
Net cost per capita	$ 0.195	$ 0.002	$ 0.179	.....
Net profit from disposal	.....	$ 1,636.60	.....	$112,296.00
Number of collections per week	1	3	2 and 3	2 and 3
Cost of collection and disposal per ton	$ 8.19	$ 3.30	$ 5.32	$ 2.16
Cost of collection and disposal per capita	$ 0.626	$ 0.258	$ 0.502	$ 0.325
Cost of collection and disposal per square mile	$ 8,709.96	$ 3,481.28	$ 4,696.20	$ 2,200.54

The figures for Los Angeles are not complete. Those submitted are for 192 square miles and 1,200,000 population. Balance handled by private contract.

is manned by a chauffeur who receives $130 per month, and a collector receiving $115 per month. The large trucks also have a laborer at $3.50 per day. All employees engaged in garbage collection, except supervisory and clerical help, are colored. The equipment is housed in a modern garage with lockers and excellent toilet facilities.

The difficulties encountered with private collection, which resulted in many complaints, were found to be due to the fact that these men were primarily interested in securing the best garbage, leaving the poor quality to be collected by city forces. As a result of these complaints, all private collections, except at certain hotels and institutions, were discontinued January 1, 1938. This has not worked a hardship on the private collectors, who fed the garbage to hogs, for they can purchase garbage at the grinding plants much cheaper than they can collect it. A sliding scale of prices is charged, depending on the price of corn. The ordinance licensing private collectors was also changed, raising the fee from $20 to $200 per year. The accompanying illustration shows the amount of garbage collected in tons per month from April, 1938, to April, 1939, and also the amount of garbage sold each month.

The following detailed costs of collection and disposal are for the fiscal year 1938-1939:

Refuse collection wages	$182,651.62
Gas, oil and maintenance of trucks	32,743.22
Garage expense	5,563.35
Total expenditure for collection	220,958.19
Tons of garbage collected by city forces	66,359
Salary cost per ton collected	$2.751
Truck cost per ton collected	0.493
Garage cost per ton collected	0.084
Cost of disposal	18,764.49
Receipts from license fees and sales of garbage	20,401.15
Cost of collection and disposal less receipts from fees and sales	219,321.53
Cost per ton of collection and disposal less receipts from fees and sales	3.305

Town Forests and Tree Planting

THE various kinds of public forest have different uses that make them all valuable in their own way. At first sight, you might think that it would be better to put them all under one management, but that is not the American way of doing things. By having different kinds of public forest we get a better chance to experiment and to avoid missing any of the benefits that the forest can give.

Organized community forests in this country, though they cover only about 3 million acres, are much more valuable than this small figure would seem to show.

Newington, N. H., a village of 381 people, has a community forest of 112 acres, established in 1710. This is the oldest town forest in the United States and has already supplied several generations of trees for the use of the community. New Hampshire now has 102 community forests, Massachusetts has 177, and New York has 579. New York City owns 22,000 acres in the Catskill and Croton watersheds, and has planted over 5 million trees on these lands.

Wisconsin has 25 county forests of 5 to 200 thousand acres each, on which over 32 million trees have been planted. There are also 149 school forests of 40 to 200 acres. School children learn in these forests about the planting and harvesting of trees, not merely as single specimens, but as a forest crop.

Michigan, New Jersey, Maine, North Carolina and several other states have municipal forests. Salt Lake City has a watershed forest of 27,000 acres. Seattle has the largest city forest in the United States, 66,000 acres. This forest has already paid off its original investment.

In the last few years the community forest idea has been spreading fast. Over 1,000 such forests are under community management to produce timber and cordwood, serve as places of recreation, and protect water supplies. But there are 20,000 counties and incorporated communities in the country, so the chance that your community runs a forest is still only about one in twenty.

How does a town get a forest? Sometimes a citizen wills a tract of land to the town. Sometimes the land is taken for taxes, or it may come on the market at a bargain and the town may buy it. If the trees are not large enough for saw timber, or there is no sawmill near enough to give them a market, the land may be for sale cheap.

The town can make more out of a forest than the private owner can usually make. The town has to buy fuel for people on relief, but it can save most of the cost if it has a forest that can be thinned. By cutting the diseased and crooked trees, and the kinds that are neither beautiful nor good for timber, the town can get a lot of cordwood and improve the woods at the same time. This kind of work is often not practical for a private owner because there is not enough market for cordwood if he should try to sell it through the ordinary trade.

After the forest has been managed for a good many years, even though it started as a second-rate patch of woods, it will begin to yield some first-class saw timber that will bring in a steady cash income to help the town treasury.

The principal value of the community forest, however, is not the money it will bring, but the effect on the people. The forest is a good place for picnics, and the people of the town grow to love it. To have an affection for a forest is good education for children.

—From "Our Forests," a new 150-page book by David Cushman Coyle, published at 25 cents by the National Home Library Foundation, Washington, D. C. See page 121 of this issue of THE AMERICAN CITY.

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Sludge as a Fertilizer

Objections to the Use of Raw Sewage Sludge—Why and How More Digested Sludge Should Be Used

By LeRoy W. Van Kleeck
Senior Sanitary Engineer,
Connecticut Department of Health

THE visitor to a modern sewage-treatment plant invariably asks about the fertilizing value of the sludge produced. Sludge consists of a mixture of water and solids, the latter being removed from the sewage by settling it in tanks. Liquid fresh sludge as it is first removed from the tanks is therefore a semi-liquid mass of raw solids.

After raw sludge is stored under controlled conditions in special tanks, usually heated, for periods up to several months, it is called digested sludge. The digestion of sludge involves a bio-chemical process in which the organic matter remaining in the sludge is in a more stable form. Raw sludge is dark-brown in color and lumpy, tends to be watery, and has a distinct offensive odor. Digested sludge is black in color, homogeneous, has the consistency of thin molasses, and has a tarry or gassy odor which is not offensive.

Liquid digested sludge is rarely used as a fertilizer; first, because of the fluid bulk that must be transported; secondly, because of difficulties with application to the area to be fertilized; and, thirdly, because of the greater likelihood of objectionable odor. Therefore, sludge is generally utilized following partial dewatering by draining it on beds of sand or by vacuum filtration. The partially dried sludge is then referred to as a "sludge cake," and ordinarily contains 70 per cent or less of moisture and is dry enough to be shoveled and spread like manure or most soil.

Objections to Use of Raw Sludge

The use of raw sludge as a fertilizer has numerous objections. It is odorous, has a high grease content, tends to make soils acid, and is a potential carrier of pathogenic bacteria. After all, such sludge, even after dewatering, is but one step removed from night soil. Unless applied strictly to orchards or forage crops in isolated areas, its use is not recommended. When used for such purposes, careful consideration should be given to its effects on soil, since liming or other soil-control methods may be necessary.

Types of Digested Sludge

Digested sludge is the most common form of sludge cake available generally throughout the United States. Most of this material is so-called primary digested sludge; that is, from sewage solids which have been settled in tanks and digested. So-called secondary or humus sludge is the solids settled from sewage after it has been passed through stone filters, known as trickling filters. This type of sludge is usually mixed with primary sludge and then digested with it.

Activated sludge is a special type of sludge produced by the agitation of sewage in the presence of air. Raw activated sludge has special properties, including a much higher fertilizing value than ordinary primary or secondary sludge. Digestion, however, as employed at many activated sludge plants, destroys much of this extra fertilizing value. When raw activated sludge is heat-dried and ground, it becomes a competitor with established organic fertilizers and it is also free of harmful bacteria. Only large activated sludge plants can profitably install the necessary drying and grinding equipment to produce such sludge. Milwaukee, Wis., produces and sells such a sludge under the trade name Milorganite.

Why Sludge Is Not Used More Extensively

Among the more probable reasons why sludge is not used more commonly as a fertilizer are the following:

1. Fear on the part of the layman that sludge will produce offensive odors, but the odor from well-digested sludge is less offensive than from most fresh manures. Sludge used on lawns will have less odor if it is well ground and worked into the soil.

2. An esthetic dislike to its use because of its source.

3. A lack of appreciation of the humus value of sludge and of the great need of most soils for such humus.

4. Failure of sewage-plant superintendents and others to encourage the use of sludge by the public. Supervising officials generally lack the time to promote sludge utilization, since their fundamental and immediate job is the treatment of municipal sewage to protect the public health and reduce water pollution rather than produce fertilizer.

5. The lumpy or chunky physical form of much sludge cake detracts from its utilization. Heat drying and grinding, or even grinding alone, creates a product which is much more amenable for use. Grinding is practiced at only a few plants throughout the country; and others might well install the necessary equipment. The user of sludge cake can with a little effort break up the material quite effectively with a hoe or other tool at home.

6. A lack of knowledge of the proper application of sludge, its limitations, and the types of vegetation for which it is adapted.

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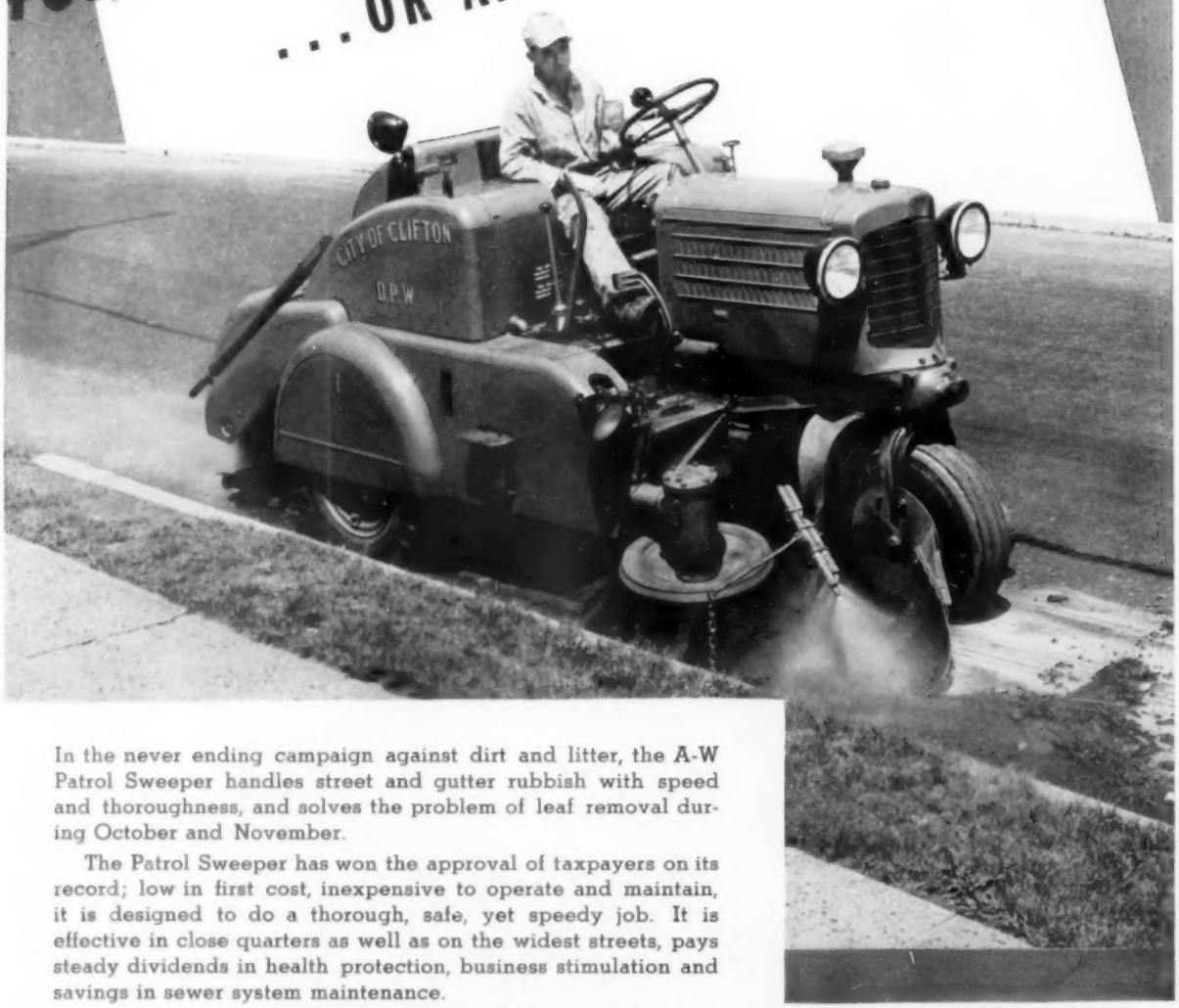

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Fertilizing Value of Sludge

Digested primary sludge is comparable in chemical fertilizing value with the ordinary run of manures. In addition, it constitutes a valuable source of humus and works a mechanical change into the soil, which improves its texture. It is also, unlike manures, comparatively free of weed seeds.

At most sewage plants throughout the country, sludge may be had for the asking and there is an economic waste in using such sludge only as ground fill. Digested sludge is certainly worth reasonable hauls of, say, five miles, if obtainable at small cost or no cost. Sludge may be transported in truck bodies or bagged for hauling in smaller amounts by private car. When sludge is used with commercial fertilizers, it will satisfactorily supplant manure, green cover crops, and other soil conditioners, which are frequently unavailable and higher in cost.

Methods of Applying Digested Sludge

Sludge may be successfully applied as a top dressing in the case of trees or lawns, or in the hill in the case of melons, squash, or other vine crops, or it may be spread, then plowed or forked into the soil.

When used as a top dressing it should not be applied too thickly especially on lawns as it may choke the growing vegetation. Sludge may be spread when the ground is frozen or covered with snow. In such cases, it is raked and pulverized into the soil in the spring. Grinding sludge cake with machines or breaking it into smaller particles by hand greatly enhances its application as a top dressing. Except where applied to grass, trees, shrubs, or perennial beds, sludge should be placed in the hill or plowed under in the fall or early spring before planting the crop.

Digested sludge is safe from the health standpoint if mixed with the soil and no more is applied to the growing crop. It is safer not to plant root crops eaten raw, such as carrots or radishes, or vegetables grown in close contact with the soil and eaten raw, such as lettuce, celery and onions, in ground recently fertilized with sewage sludge.

The digestion of sludge, together with the common methods of dewatering and its storage, afford sufficient protection against intestinal diseases. Reasonable care should be exercised in handling it. The special committee of the Federation of Sewage Works Associations reporting on "Utilization of Sludge as a Fertilizer," *Sewage Works Journal*, November, 1937, states: "The committee knows of no case of sickness traceable to the use of digested sludge or activated sludge."

Summary

From the health standpoint, undigested sludge is dangerous to use for a fertilizer under most conditions. Digested sludge can be used with safety when reasonable care is exercised in handling and with the precautionary considerations mentioned. It should not be used for root crops or vegetables grown in close contact with the soil and eaten raw.

—From a discussion appearing in the Connecticut Health Bulletin.

Should Cities Distribute Milk?

FOR years both producers and consumers have been dissatisfied with the high costs of milk distribution: only one-half of the dollar which consumers pay for milk goes to the farmer who produces it, the other half goes for processing and distributing. Many studies have been made of ways for reducing milk-distribution costs; many proposals have been made for accomplishing this end. Among them has been the suggestion, which has been gaining increasing attention, of making milk distribution a public utility. The College of Agriculture of the University of Wisconsin, under the direction of Prof. W. P. Mortenson, has made a four-year study of the advantage and limitations of milk distribution under public utility control, the results of which are published in the book, "Milk Distribution as a Public Utility," by Professor Mortenson.

The following is taken from the "Conclusions and Outlook" at the end of the book:

". . . an efficiently operated, unified system of milk distribution could bring about a reduction of milk-distribution costs by amounts varying from, say, 1½ to 2 cents or perhaps even 2¼ cents per quart of milk handled. However, even though it can be shown that such savings could be brought about, there is no proof or certainty that they would be carried out if unification in milk distribution were put into effect.

"If it were certain that those who are given responsibility for the government of a city—or state—were always thoroughly qualified to direct this new business and that, in addition to such qualification, they could also be depended upon to see that it was operated strictly in the public interest, with no personal or political considerations or favors, then it would be a relatively easy and simple matter to predict the extent of savings which would actually be effected. But can we always be confident that such conditions will be carried out? An undertaking such as the distribution of milk under public utility control will be a pronounced success to the extent, and only to the extent, that those concerned—producers, consumers, and city and state officials—have the will and the capacity to make it succeed.

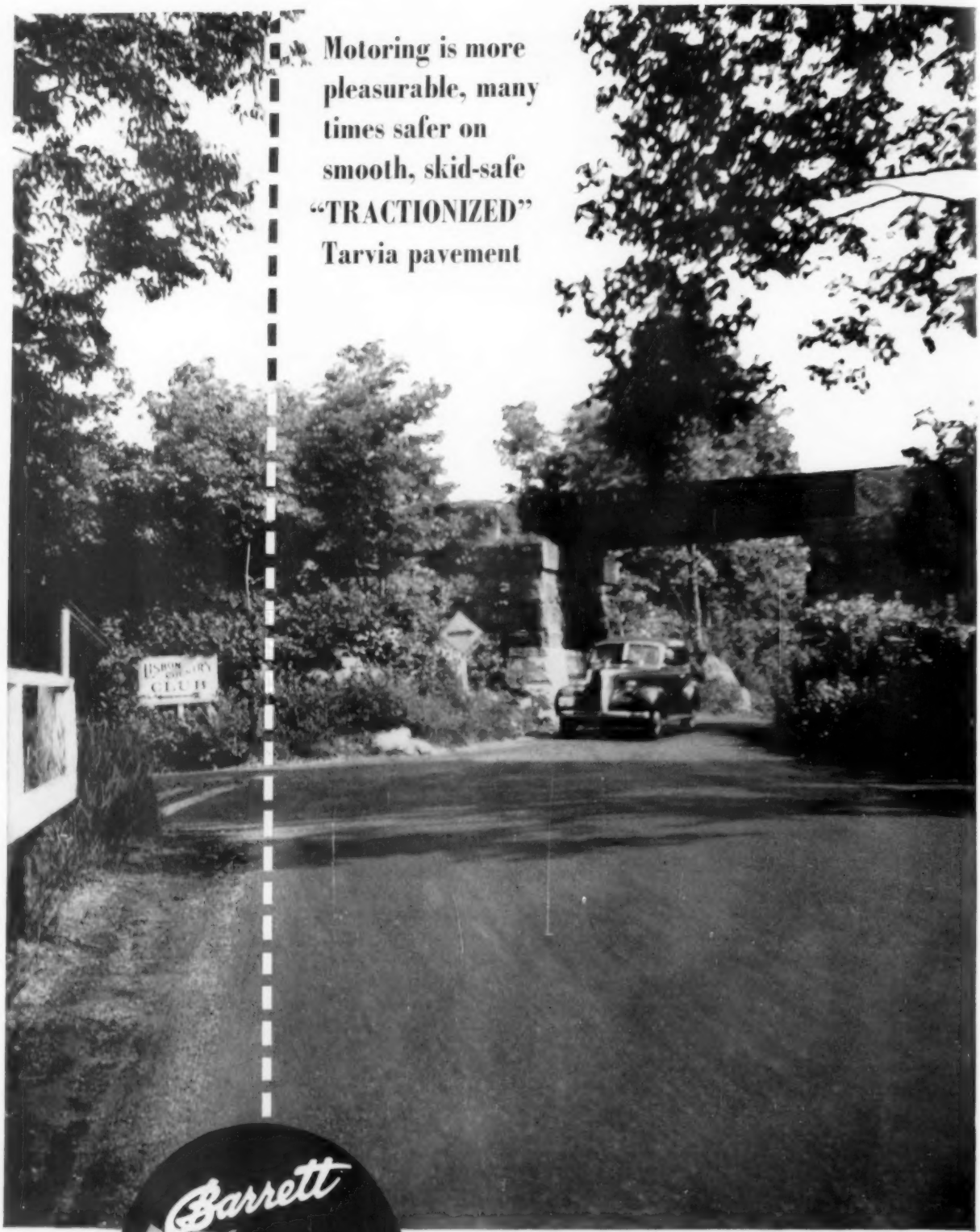
"Even though public utility operation of milk distribution may permit of economies, what is the likelihood that such a system will be generally adopted in the near future? The rate of progress of such a movement will depend partly upon the amount of public criticism of the existing system, but more upon economic conditions in cities. The greater the pressure upon consumer budgets, the more rapidly can changes be expected in that direction.

"It would seem that major changes of this nature should move slowly, perhaps starting as experiments in a few markets where existing distribution costs are relatively high or services unusually poor. If a reasonable degree of success can be achieved under such circumstances, then the experiment will furnish valuable information for other cities to follow. In cities where there exists a combination of competent public officials, a healthy budget, and a population which would support this type of enterprise—the conditions would be ideal for such an experiment.

"Judging by recent trends in legal decisions on public regulation, it appears that there is much more than an even chance that the legality of public utility control would be upheld by the courts. To be sure, a few years would be required to clear up all the legal rights and powers of a city to control or to operate the milk-distribution system to the exclusion of private enterprise. In the meantime, litigation would hamper the free operation of the plan and produce delay, uncertainties, irritation, and expense.

"From the standpoint of a disinterested observer the case for milk distribution under a unified system is very strong, and likewise from that of the consumer the case for such a system is clear cut. On the other hand, from the standpoint of the distributor and of organized labor the opposition will be powerful, while the producers, especially the organized producers, will not favor the change although they may be converted."

EDITOR'S NOTE.—The foreword of the book states that no American city has had experience in handling milk as a public utility. However, for the experience of a New Zealand city, see the article in the January, 1940, issue of THE AMERICAN CITY, page 47, on the Wellington milk plant, entitled, "A Municipally Owned and Operated Milk Plant," by H. Bronson Cowan.



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Water-Supply Interruption

Report of National Board of Fire Underwriters on Break at Pumping Station in Buffalo, N. Y., Has Many Warnings for Designers and Operating Men

AN unusual, but not unpredictable, series of events on January 3, 1940, in Buffalo, N. Y., resulted in leaving most of the 600,000 people of this city without water for domestic use or fire protection for a period of several hours.

In 1909, because of the recognized danger of depending entirely upon the single Massachusetts Avenue pumping station, the Col. Ward pumping station was built, thus giving four 30,000,000-gallon pumps in one location, and five 30,000,000-gallon pumps in the other, each with its separate boilers and discharge lines.

A recent tendency has been to concentrate pumping capacity in the Col. Ward pumping station, and there has been some thought of abandoning the Massachusetts Avenue station as an economic move. Three 50,000,000-gallon electrically operated pumps were placed in service in the Col. Ward station in 1939, and the Massachusetts Avenue station was placed in reserve.

A further, and seriously objectionable, concentration consisted of placing the pumps of the special high-pressure fire system in the Col. Ward station. This system is essentially of importance in an emergency; in other cities such systems have been built as entirely independent units, which would permit them to furnish conflagration protection to the congested-value district during any impairment of the city's water system.

Other features of unreliability in the design of the water works were that all the pumps in the Col. Ward station were in a pit about 15 feet deep, with no drainage except that provided by sump pumps of relatively small capacity. This, especially for the recently installed electrical pumps, introduced the probability of interruption by flooding through the breaking of any of the discharge mains. The pump pit was interconnected with an extensive gallery containing three 60-inch cast iron mains, which delivered supply to the distribution system and acted as headers for the seven pump discharges. These mains and discharge connections were equipped with valves which could be operated only by hydraulic pressure, with the necessary control devices located in the gallery and subject to flooding from a break in any of the mains. Recognizing the danger inherent in this condition, plans had been prepared, but funds not yet obtained, for the separation of this header room from the pump room and for the moving of the hydraulic valve controls, and the pump which furnished the necessary pressure for the operation of the valves, to a place above any flood level.

A further, but unrecognized, danger, primarily from the health standpoint, was a steam-line tunnel from the pump room to the filter plant. This tunnel was provided with a single metal covered door, without door check or other arrangement to keep it closed.

The Break Occurs

At 1:05 A. M. Wednesday, January 3, the cast-iron discharge of No. 3 steam pump ruptured, apparently from tension strain, at a point just beyond the 60-inch check-valve. The pressure at this time was 78 to 80 pounds, or 5 to 10 pounds less than that normally carried in the daytime; two 50,000,000-gallon electric pumps were operating. A circumferential separation of ¼-inch, with a hole of about 2 square feet area near the top, resulted in flooding the entire pump room to a depth of about 10 feet.

The recording gage shows that the three 2,000,000-gallon elevated tanks and the distribution system at the upper elevations of the city were drained in about 45 minutes. It was impossible to operate the hydraulically controlled valves on the pump discharge header system. The electric pumps which were operating were shut down, and all the electric pumps were soon under several feet of water, as were the switching arrangements; soon after, water had passed through the tunnel and flooded the low-lift filter pumps, putting the filter plant out of service.

Prompt Emergency Action

Two emergency gangs were called, and other distribution system men were obtained as rapidly as possible; these, aided by men from three fire companies called by Commissioner Castimore of the Fire Department, started closing the necessary hand-operated gates of the discharge mains where they connected into the distribution system; these included two 60-inch, several 48-inch and some smaller valves. Complete shut-off was made about 4:20 A. M.

One boiler at the Massachusetts Avenue station was under steam. Others were fired up as soon as it was recognized that the Col. Ward station was out of service. It is estimated that the second boiler was available in 1½ hours. All four Massachusetts Avenue pumps were in operation by about 5:45 A. M., giving a total capacity in excess of consumption demand. After using the 30,000,000-gallon storage in the clear-water basin, emergency gates to the intake tunnel were opened, permitting chlorinated lake water to be delivered to the pumps.

The pump pit of the Col. Ward pumping station was cleared of water through the use of Fire Department pumpers, some portable contractors' pumps and, later, sump

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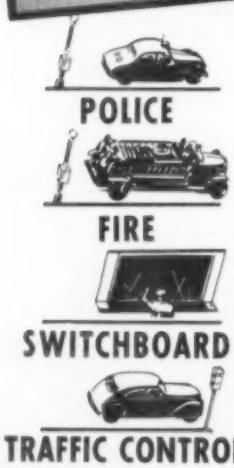

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pumps, which had been submerged. The broken discharge line was isolated, through the use of compressed-air operation of the necessary hydraulically operated valves, and at 11:30 and 11:45, two of the 30,000,000-gallon steam pumps were put into service.

Pressure was mainly restored by 12:30, noon, and was normal about 4:00 P. M. Fire protection in the city at that time could be considered as normal. A total of 240,000,000 gallons in eight pumping units was available against a possible demand for domestic and fire service of 192,000,000 gallons, required under maximum consumption demands, which should not be reached at this time of the year. At about the same time the steam pumps of the high-pressure fire system were put in service, making available 9,000 gallons a minute from this system.

The filters depended upon low-lift pumps connected to 2,200-volt slip ring electrical motors. The controls for these pumps were not flooded; after dewatering the pump pit, drying out of two of the larger pumps was started, using low-voltage current from a portable generator.

In the case of the three 50,000,000-gallon electrically operated service pumps and the three high-pressure fire system electric pumps, not only were the motors submerged, but also the switch and starting controls. These last had to be dismantled and overhauled. Motors were dried out through the use of steam-heated space heaters attached to wooden tripods. The service pumps, which had a 4,157-volt synchronous motor, when put in service after a period of about two weeks developed shorts to ground, and required additional work. The high-pressure fire service pumps which had 2,200-volt slip ring induction motors, were baked out with dc current.

The principal lesson from this catastrophe is that when water supply is dependent upon direct pumping, with little storage available, cities of metropolitan size should not depend upon a single pumping station. Separation of the pumps into two or more groups is essential, as is also the need of providing two or more power sources which cannot be put out of service through the same happening.

—Prepared with only minor changes from Bulletin No. 102 of the National Board of Fire Underwriters.

The "Pros and Cons" of Municipal Consolidation

By ALVIN A. BURGER
Director, Department of Government Research, New Jersey State Chamber of Commerce

NEW JERSEY is giving increasing attention to the subject of municipal consolidation. There is widespread belief that carefully planned mergers of municipal governments, particularly in urban areas, might offer good opportunities for substantial reduction in local operating costs, thus paving the way to lower tax rates.

Two organizations, the New Jersey State Chamber of Commerce and the Princeton Local Government Survey, convinced that the subject deserved some thoroughgoing exploration, last year decided to join in making a series of field studies to determine just how productive these opportunities for tax savings and for improved service standards might be.

At the outset it was essential that a workable municipal consolidation law be enacted. New Jersey had laws permitting the merging of two municipalities, but under circumstances savoring of "anschluss." They were really "annexation" laws. A new law was needed which would permit two municipalities to consolidate on a mutually voluntary basis, according to a carefully worked-out reorganization plan. Such legislation, drafted early in 1939 at Princeton, was passed.

Closely bound together geographically, economically and socially, the two thriving industrial New Jersey cities of Passaic (population 62,000) and Clifton (49,000) seemed to be a "natural" for a study of the advantages and disadvantages of municipal consolidation. These cities, therefore, were selected for the first field study.

The survey revealed that a well-planned, businesslike consolidation would produce good opportunities for improved municipal services and eventual savings in operating costs. This appeared to be especially true in respect to the fire and police departments, public works services, public health, public schools, and garbage disposal. Opportunities for cost reductions resulting from consolidation were found to be not as great as the surveyors first believed they might be. It was indicated, however, that future expenditures would not increase materially in any department for some time under a consolidation, despite Clifton's increasing population.

It was disclosed that general advantages to the new, greatly enlarged municipality would be likely to include (1) improved opportunities for economic development; (2) a wider range of public services and a reduction of present overlapping functions; (3) an absence of costly rivalries and duplicated capital investments; and (4) an improved municipal credit status.

On the other hand, there were found to be several practical obstacles to a mutually satisfactory consolidation of the two cities, the greatest, perhaps, arising from the disparity in local assessment practices. Property in Clifton was found to be more conservatively assessed than in Passaic, causing the actual tax bill on a given property in Clifton to be somewhat less than on a similar property in Passaic.

Also, Passaic's scale of expenditures for public services was higher than in Clifton, largely because Passaic's city departments are manned and equipped to meet the demands of a fully developed community, whereas those in the younger Clifton are maturing gradually as the community grows.

A third obstacle to consolidation lay in Clifton's satisfaction with her city manager plan, and a distrust of the Passaic commission form, but the survey found much sentiment in Passaic for an acceptance of the city manager plan in case of a merger.

Disparity in debt burdens is generally a major obstacle to consolidation; but in the case of Passaic and Clifton, both cities having a gross debt of relatively similar size and both showing steady employment, debt and finances seemed to offer no real deterrent.

The survey report made no recommendations; it simply presented facts. These facts are being seriously weighed and considered in Passaic and Clifton, but there should be no haste in arriving at a final verdict. After all, the consolidation of two important municipalities is a business undertaking of huge proportions.

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Small-Town Water Works

Centerburg, Ohio, Has New Iron-Removal and Lime Softening Plant with Simple Carbonation Outfit

By E. F. Hoover
Superintendent, Water Department

THE Centerburg Water Works no doubt ranks among the smallest in the United States, yet its individual consumers, as in any large city, are entitled to the best water obtainable. Centerburg is located very close to the geographical center of Ohio in Knox County. It has a population of only 775, yet it has practically all the improvements found in a city and was one of the few small towns to have a complete sewerage system and treatment plant 25 years ago.

In 1912, a municipal water-works system was completed and placed in operation in Centerburg. The water mains are practically all cast iron with heavy lead service connections from the main to the curb stop. The plant is about a quarter-mile from the village at about the same elevation. The source of water is drilled wells, the one now in use being 70 feet deep and equipped with a Pomona centrifugal pump of 250-gpm capacity.

The New Plant

In August, 1936, a new iron-removal and softening plant of the lime treatment and filtration type was placed in operation. The new structure occupies an area of 20 x 42 feet and is a one-story brick building. The operating room is 18 feet by 18 feet 8 inches, to the rear of which extends the chemical storage room, about 12 x 22 feet in plan. The pump room and pipe gallery are beneath the operating room.

The plant contains a mixing tank 3 by 13 feet 3 inches in plan by 10 feet deep, in which there is a mixing machine operated by a ½-hp motor. The wells are located in the yard, and the raw water is pumped into the end of the mixing tank, over which is installed a constant-rate dry chemical feeder, made by the International Filter Co., delivering lime to the water. After mixing, the water passes into an 18 x 18-foot by 10-foot deep settling basin at the top of which is a weir 6 inches deep and 9 inches wide which conducts the settled water through a carbonation tank 3 x 4 feet in plan and 10 feet deep, where carbon dioxide is added before the water enters the filters.

The two filters are each 6 x 8 feet by 10 feet deep and are equipped in the bottom with a 6-inch cast iron manifold, with 1½-inch laterals. Over the manifold is placed 22 inches of gravel in five grades, and on top of the gravel 30 inches of fine sand. Extending across the center of each filter just above the top of the sand is a steel V-shaped trough through which the raw water enters and which is also connected to the sewer line to take care of the wash water when the filter is back-washed.

From the filters the water is delivered by a centrifugal pump of 100 gpm capacity, driven by a 7½-hp electric motor, into a 60,000-gallon elevated tank, the overflow of which is 145 feet above the ground. This gives a pressure of 65 pounds in the village when the tank is nearly full.

Carbonation Outlet

When the plant was built, the contract did not include the equipment of one filter and the carbonation chamber. It was soon discovered, however, that if enough lime were added to obtain the desired degree of hardness, too much caustic alkalinity resulted. The operator installed a simple carbonation outfit designed by the Engineers, and very satisfactory results have been secured. Natural gas is burned in a stove made by cutting an old 30-gallon hot water tank in two parts, using the upper half, to which were bolted three 8-inch legs. A door was cut near the bottom, and an ordinary cookstove burner was installed after the holes had been re-bored to admit more gas. A 1-inch pipe was run from the opening on top to a point near the bottom of another tank 1 foot in diameter and 5 feet high. In this tank coarse limestone was placed, and over it a stream of cold water is sprayed to form a scrubber. A pipe is extended from the top of this tank through the top and to near the bottom of another tank of the same size, where the moisture is allowed to settle, and the dry carbon dioxide gas is taken from the top by an ordinary compressor run by a 1-hp motor. The

The Centerburg, Ohio, Water-Treatment Plant, Showing One of the Wells at the Left and the Foundation of the Elevated Steel Storage Tank in the Right Foreground

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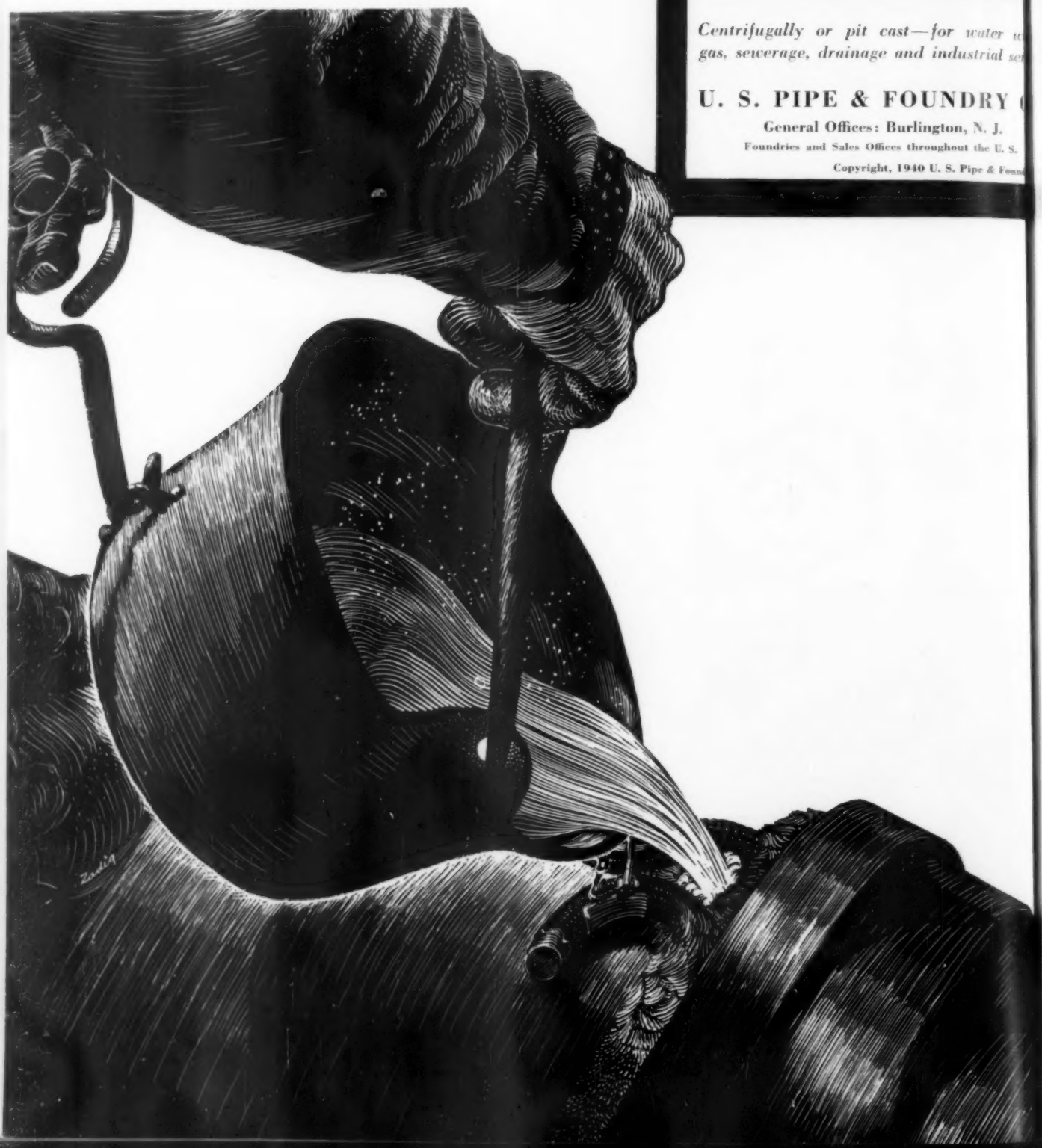


gas is forced to the bottom of the carbonation chamber through a manifold of two 1½-inch pipes filled with small holes underneath.

Results

The raw water has a total hardness of about 272 ppm, iron 1.2 ppm, and fluoride 2.0 ppm. As the consumption is almost entirely for domestic purposes, a hardness of 70 ppm is found to be very satisfactory. This can be obtained easily and at the same time reduce the iron content to about 0.1 ppm and the fluoride to about 1.0 ppm.

Had the plant not been built when it was, the Ohio State Department of Health probably would have compelled the erection of a plant for the purpose of reducing the fluoride content, as the Department now will not approve a water supply with 2.0 ppm or more fluoride, which is present in the deep-well supplies of the northwestern part of the state.

The 250-gpm well pump is operated at a rate of a little less than 220 gpm, so that the two 100-gpm filters may take care of the water. The pumps to the filters are controlled by floats connected to butterfly valves on the discharge lines, thereby maintaining a fairly constant level of water on the filters.

The following is a summary of the plant's operation for the year 1939:

Total number of gallons pumped	10,911,747
Total pounds of lime used	35,517.5
Total cost of lime	$204.23
Average number of gallons pumped per day	29,910
Average number of pounds of lime per day	97.3
Average cost of lime per day	$0.56
Average grains of lime per gallon	22.28
Average hardness in ppm	69

Daily alkalinity tests are usually made, and complete monthly operation reports are forwarded to the State Department of Health.

Rates and Personnel

At the present, there are 270 active services in Centerburg, all of which are metered. The water rates are as follows:

Minimum quarterly chge. for 4,000 gals.	$3.00
4,001 to 15,000 gals.	40 cents per 1,000 gals.
15,001 to 25,000 "	30 " " " "
All over 25,000 "	25 " " " "

Bills are payable on or before the 15th of January, April, July and October, after which a 10 per cent penalty for non-payment is added.

Fortunately, capable, public-spirited men have for some time served on the Board of Public Affairs, which has sole control of the finances, outside of salaries, and through their cooperation the plant is on a paying basis and each year some improvements have been made in the way of landscaping, shrubbery, painting and the purchase of needed modern equipment. The plant was designed by Hoover and Montgomery, consulting engineers, Columbus, Ohio, of which C. P. Hoover, Chemical Engineer, of the Columbus Water Works, is senior partner. The plant was built by Downing and Hetrick, Inc., of Columbus, Ohio, at a total cost of $12,750, of which 45 per cent was a PWA grant.

New Population Figures

UP TO August 29, 1940, the Bureau of the Census had released the 1940 population figures of 58 cities having more than 25,000 inhabitants, in addition to the figures for the 274 cities listed on page 5 of the August issue of THE AMERICAN CITY. The new listings follow:

City	Population 1940	Per Cent Increase 1930-1940	Per Cent Increase 1920-1930
Alexandria, Va	33,800	40.0	33.7
Asheville, N. C	51,227	2.1	76.1
Baton Rouge, La	34,337	11.7	41.1
Central Falls, R. I	25,121	—3.0	7.1
Charleston, S. C	70,869	13.8	—8.4
Chelsea, Mass	41,069	—10.4	6.1
Clifton, N. J	48,840	4.2	77.1
Covington, Ky	62,014	—5.0	14.2
Cranston, R. I	47,173	9.9	45.9
Cumberland, Md	43,127	6.3	26.5
East Orange, N. J	68,589	0.8	34.1
East Providence, town, R. I.	32,093	7.0	37.6
Eau Claire, Wis	30,517	16.1	25.7
Glendale, Calif	81,744	30.3	363.5
Haverhill, Mass	47,323	—2.8	—9.6
Highland Park, Mich.	50,727	—4.2	13.9
Jackson, Miss.	61,965	28.3	111.3
Johnson City, Tenn	25,416	1.3	101.6
Joplin, Mo	37,132	11.0	11.9
Kalamazoo, Mich	53,892	—1.6	13.0
Lansing, Mich	78,479	0.1	36.8
Lawrence, Mass	85,049	*	—9.8
Lewiston, Maine	38,083	9.0	9.9
Lexington, Ky	49,311	7.8	10.1
Lynn, Mass	98,072	—4.2	3.2
McKeesport, Pa	55,460	1.5	16.8
Mobile, Ala	78,324	14.8	12.2
Montclair, N. J	38,543	—8.3	45.8
Montgomery, Ala	78,008	18.1	52.0
Ogden, Utah	43,719	8.6	22.8
Owensboro, Ky	30,125	32.3	30.7
Paducah, Ky	34,108	1.4	35.6
Parkersburg, W. Va	30,088	1.6	47.7
Pawtucket, R. I	75,499	—2.2	20.1
Pittsfield, Mass	49,863	0.4	18.9
Pontiac, Mich	66,716	2.8	89.4
Portland, Maine	73,464	3.7	2.2
Revere, Mass	34,376	—3.7	23.8
Richmond, Ind	35,040	7.8	21.4
Roanoke, Va	69,167	0.1	36.1
Rochester, Minn.	26,274	27.4	30.3
Rock Island, Ill	42,648	12.4	7.9
Rome, Ga	26,253	20.2	64.8
Rome, N. Y	34,239	5.9	22.8
Royal Oak, Mich	25,136	9.7	281.3
Salem, Mass	41,303	—4.7	1.9
Salem, Ore	33,773	17.2	48.6
San Jose, Calif	68,298	18.5	45.4
Superior, Wis	34,944	—3.2	—9.0
Teaneck, twp. N. J	25,130	52.2	203.9
Warwick, R. I	28,616	23.4	72.1
Waterbury, Conn	99,158	—0.7	8.9
Wausau, Wis	26,748	12.6	25.4
West Hartford, town, Conn	33,744	35.3	181.7
West Palm Beach, Fla.	33,208	24.8	207.3
Wilkinsburg, Pa	29,756	0.4	21.5
Woodbridge, twp. N. J	27,157	7.5	88.2
Woonsocket, R. I	49,204	—0.3	13.5

Twp.—classified as urban under special rule.
A minus sign(—) denotes decrease.

*Less than 0.1 per cent.

The Department of Commerce calls attention to the fact that the population figures now being released are based on counts made by the District Supervisors in the field and may be changed somewhat when the final count is made in Washington.

In this connection see "Avoiding Census Jitters" and "The Census and Your City" on pages 56 and 111, this issue of THE AMERICAN CITY.

When Handling Suspected Bombs

CIVILIANS may save lives and assist police officials in the handling of bombs, suspected bombs and explosives, by following one simple rule, the International Association of Chiefs of Police points out.

The rule: *Don't touch the suspected package or object, but notify officials trained to handle such cases.*

This advice has been offered both civilians and police officers by police departments of several cities in efforts to avert tragedies similar to the recent bomb explosion at the New York World's Fair which killed two detectives and wounded four other members of the New York City Police Department.

Police departments which have made recent studies on the handling of suspected bombs include those of New York City, Cleveland, Indianapolis and Chicago, and the New York State Police Department. The Cleveland Police Bureau of Scientific Investigation outlines the following precautionary measures to be followed by both civilians and police in handling suspicious packages or objects:

1. Never attempt to remove any suspected package from the position in which it is originally discovered.

2. Never throw water upon or immerse in water any suspected explosive or incendiary machine, as it may be the type that will explode by improper handling or immersion in water.

3. Never attempt to open suspicious packages by the intended method.

Police officers are advised by the recent studies on the handling of suspected explosives to clear the scene as quietly and quickly as possible of spectators and other persons. If the package is in a building, Indianapolis police are advised to order civilians to leave through the usual exits if it does not require passing close to the suspected bomb; otherwise, emergency exits should be used.

The Indianapolis Department, it was pointed out, regularly uses a portable X-ray for examining suspected packages.

"Unfortunately, there is no known safe method for the handling of infernal machines," the Association said, "but caution, together with good judgment, will assist in averting incidents similar to the New York tragedy."

Do you know that an old pump, seemingly faithful, can actually be in conspiracy to keep your municipal water pumping cost high?

If that pump is ten or more years old, regardless of condition, it is almost a certainty that it is costing you at least 10% more to operate than it should.

Today's Fairbanks-Morse Pumps of more efficient design, made by improved methods, actually pay dividends equal to 10% or more of the power cost of present obsolete pumps and pay additional savings in lower maintenance.

Why not investigate? Write Fairbanks, Morse & Co., Dept. 01, 600 S. Michigan Ave., Chicago, Ill. Branches and service stations throughout the United States and Canada.

* * *

Fairbanks-Morse Centrifugal Pumps—a complete "family" of single-stage, split-case, centrifugal pumps for low, moderate, medium, and high heads. Write for Bulletins 5810D and 5843.

Fairbanks-Morse builds the right type of pump for every job—and builds the right type right.

FAIRBANKS·MORSE PUMPS

DIESEL ENGINES ELECTRICAL MACHINERY RAILROAD EQUIPMENT WASHERS-IRONERS STOKERS
MOTORS FAIRBANKS SCALES WATER SYSTEMS FARM EQUIPMENT AIR CONDITIONERS

Do you mention THE AMERICAN CITY? Please do.

Water Rates and Service Charges

1940—Part IX

Covering Domestic and Industrial Meter Rates, Discounts and Penalties, Installation Charges, Fire Hydrant Rentals and Fire Sprinkler Costs

Menasha, Wis.

Present population	10,000
Population served	10,000
Number of active services	2,285
" " meters	2,304
" " hydrants	209
Miles of water main	29.9

The water rates at present in force at Menasha for general service including domestic, industrial and commercial supplies are:

First 9,000 gals. used per quarter-year, minimum charge for each size of meter
Next 45,000 gals. used per quarter-year, $.30 net per 1,000 gals.
Next 156,000 gals. used per quarter-year, $.10 net per 1,000 gals.
Next 390,000 gals. used per quarter-year, $.08 net per 1,000 gals.
Next 750,000 gals. used per quarter-year, $.06 net per 1,000 gals.
Next 900,000 gals. used per quarter-year, $.04 net per 1,000 gals.
Next 1,500,000 gals. used per quarter year, $.03 net per 1,000 gals.
Over 3,750,000 gals. used per quarter-year, $.02 net per 1,000 gals.

The minimum quarterly bill with one consumer on a meter and depending on the size of the meter is:

⅝" meter	$ 3.0
¾" "	4.2
1" "	6.2
1¼" "	7.0
1½" "	8.7
2" "	14.2
3" "	25.0
4" "	45.0
6" "	75.00
8" "	120.00
12" "	180.00

Water to the amount of the minimum charge is furnished before any additional charge is made for water used. In the case of compound meters, the larger meter determines the minimum charge.

There is an additional quarterly charge on the minimum charges for all compound meters owned by the city of Menasha, as follows:

8" and 4" combination	$20.00
12" " 6" "	36.00

Readings of water meters are taken during each month and the bill is rendered by the Department dated as of the last day of the month. All bills are payable on the first 10 days of the month following the date of the bill, and become delinquent after the close of business on the 10th day of the month following the date of the bill. All delinquent consumers are subject to discontinuance of service. Where service is discontinued, a charge of $2.00 is made and collected before service is restored, to cover the cost of labor and incidentals in connection with shutting off and turning on the service.

Application for water service must be made at the Water Department's office on contract provided for that purpose. The applicant must give the name, and the location of property, and pay a fee of $12 for a ¾" supply line and fittings. On all supply lines larger than ¾" internal diameter furnished by the Department, a deposit is required before work is begun to cover the actual cost of materials and labor plus 12% to cover incidental charges. The Water Department taps the main, furnishes all pipe, fittings, labor, etc., and installs the service up to and including the curb stop. The service and connection remains the property of the city of Menasha at all times. The supply pipes from the main to the curb stop are maintained and kept in repair at the expense of the Department. It is the duty of the owner of the premises to maintain the service pipes from the curb stop to the meter.

A charge is made for public fire hydrants, and for private fire lines having automatic sprinkler heads for fire protection.

J. H. Kuester,
Superintendent, Water Department.

Whittier, Calif.

Present population	17,500
Population served	17,500
Number of active services	4,300
" " meters	4,300
" " hydrants	355
Miles of water main	62

The meter rates for Whittier within the city limits are as follows:

First 1,000 cu. ft. per month	$1.00
Next " " " or less	$.08 per 100 cu. ft.
" 3,000 " " "	.07 " " " "
" 5,000 " " "	.06 " " " "
All over 10,000 cu. ft.	.05 " " " "

Water bills are due and payable when rendered and become delinquent 15 days thereafter. If bills are not paid when delinquent, water service may be discontinued without further notice. On failure to comply with the rules or regulations or to pay rates or charges due as provided, the water may be shut off at any and all services where the delinquent consumer is being supplied with water, until payment of all amounts due, together with $1.00 in addition as a fee for turning the water off and on.

The water rates charged by the Department for water supplied through meters for use outside the city limits, and permitting the use of 1,000 cu. ft. per month, are:

⅝" or ¾" meters	$2.00 per month
1" "	2.50 " "
1½" "	3.00 " "
2" "	4.00 " "
3" "	6.00 " "
4" "	8.00 " "
6" "	12.00 " "
Next 1,000 cu. ft. or less	$.16 per 100 cu. ft.
" 3,000 " " "	.14 " " " "
" 5,000 " " "	.12 " " " "
Over 10,000 cu. ft.	.10 " " " "

Any consumer may demand that the meter through which water is being furnished be examined and tested by the Water Department to determine whether it is registering correctly. This request must be made in writing to the Water Department, and must be accompanied by a deposit of $1.00. The Water Department then tests the meter, and if it is found to register over 2% more water than actually passes through it, another meter is substituted therefor, and the fee is repaid to the person making the application, and the water bill for the current period adjusted in a fair manner. If the meter is found to register not over 2% high the $1.00 deposit is forfeited to the city and the water bills must be paid as rendered.

Application for water for new houses or premises not previously provided with water must be made to the Water Department and accompanied by a service charge covering the particular size of service required. Service pipes are laid from the main to a point inside the nearest curb line where the curb cock and meters are installed. The installation and maintenance of all pipe on the property side of the meter must be performed by the consumer. The charges made by the Water Department for the installation of services and meters constitute service fees; the service pipes and water meters installed remain the property of the city of Whittier Water Department at all times. They are maintained, repaired, and renewed by the Water Department when rendered unserviceable through or-

REPORTER: What happened, anyway?

SUPERINTENDENT: We had a break in a main. The crew we sent out to cut it off spent twenty minutes trying to close the old main valve. It was jammed. The balky valve had been in the line long before I took over here. We're going to replace it with a Ludlow. Ludlow's flexible-action gates provide positive closure, even after years of service in the open position.

LUDLOW VALVES

The parallel seat, double wedge type slide gate valve, developed and perfected by Ludlow, has been the universally accepted construction in all waterworks valves for nearly three-quarters of a century. It provides all these essential benefits:

Smooth, Positive Operation. Gates positioned *directly* opposite ports before wedging, and entirely unwedged *before* being raised.

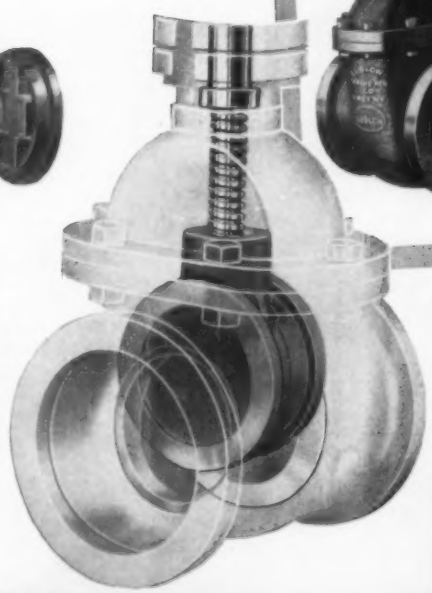
Positive Closure—even after years of service in the open position; flexible-action gates *self-adjusting* to seats.

Self-Cleaning. Rings cleaned *throughout entire stroke.* No *internal guides* to cause foul-up.

Ready Replacement of Parts. Simple construction with ample tolerances, permitting ready replacement of parts.

LUDLOW PRINCIPLE

Self-releasing 30° angle wedges and flexible action gates self-adjusting to seats for improved performance, and longer life.



Ludlow Hydrants

The slide gate principle, developed and perfected by Ludlow, insures *complete security* in fire hydrants. It provides *all* these advantages:

Quick Water with least possible shock. Proper shut-off without water hammer.

Proper Drainage. Hydrant automatically drained at lowest point when closed.

No Flooding. Accidental breaking of the hydrant, such as might result by collision from a heavy truck, will not cause flood since the gate when closed is wedge-locked.

Easy Inspection and Servicing without unscrewing anything below the ground level. All working parts removed as one unit by lifting stem through top of hydrant.

The LUDLOW VALVE MFG·CO·INC· SINCE 1866 TROY·N·Y·

dinary wear and tear. If, however, replacements, repairs or adjustments are made necessary by any negligence or carelessness on the part of the consumer, or any member of his family or any representative or person in his employ, any expense caused to the Water Department is charged against and collected from the consumer.

The charges for the installation of water services are as follows:

Before Pavement is Laid	
¾" service	$15 00
1" "	25 00
1½" "	50 00
2" "	80 00
After Pavement has been Laid	
¾" service	$35 00
1" "	45 00
1½" "	70 00
2" "	100 00

Services larger than 2" are charged for at the cost of material and labor used plus 10% for supervision, and all charges are due and payable as soon as the work is completed.

Fire hydrants installed in any street, alley, parkway, or property owned by the city of Whittier are furnished, placed and maintained and repaired by the Water Department. There is an annual rental of $20 per fire hydrant paid from the general fund of the city of Whittier on the 1st day of January of each year for the current fiscal year.

Where pipes are provided and installed by the Water Department for private fire protection, a charge is made for time and material plus 10% overhead; and wherever it is deemed necessary to install a proportional meter, the charge includes the cost of the meter. These services may be used only in case of fire, and if used in violation of this provision, a fine of $25 is imposed for each such use, and in addition the water is cut off until the fine is paid.

L. R. Abbott,
Deputy City Engineer.

Michigan City, Ind.

Present population	28,000
Population served	29,250
Number of active services	5,502
" " meters	5,502
" " hydrants	555
Miles of water main	66.6

The meter rates for water used by all consumers except city buildings are as follows:

First 1,000 cu. ft. per mo.	$1.00 per 1,000 cu. ft.
Next 1,000 " " "	.90 " " " "
" 3,000 " " "	.80 " " " "
" 5,000 " " "	.70 " " " "
" 5,000 " " "	.60 " " " "
" 10,000 " " "	.50 " " " "
" 20,000 " " "	.45 " " " "
" 30,000 " " "	.40 " " " "
Over 75,000 " " "	.35 " " " "

The monthly minimum charge for these services is:

⅝" meter or smaller	$ 1 00
¾" "	1 70
1" "	2 65
1¼" "	3 75
1½" "	5 00
2" "	6 00
3" "	10 00
4" "	17 50
5" "	27 00
6" "	40 00

On meters over 6" in size the minimum charge is proportional.

The meter rates and schedules for all city buildings, including schools, are:

First 1,000 cu. ft. per mo.	$ .75 per 1,000 cu. ft.
Next " " " "	.70 " " " "
" 3,000 " " "	.65 " " " "
" 5,000 " " "	.60 " " " "
" 5,000 " " "	.55 " " " "
" 10,000 " " "	.50 " " " "
" 20,000 " " "	.45 " " " "
" 30,000 " " "	.40 " " " "
Over 75,000 " " "	.35 " " " "

The monthly minimum charge for city buildings and schools is:

⅝" meter or smaller	$ .75
¾" "	1 10
1" "	2 00
1¼" "	2 35
1½" "	3 40
2" "	5 00
3" "	9 00
4" "	16 00
5" "	25 00
6" "	36 00

All water bills are due and payable at the office of the Department of Water Works within 15 days from the date of the bill. If the bill is paid within 15 days, the rate above is applied, and if not paid within 15 days, a collection or deferred payment charge of 10% is added to each bill amounting to $3.00 or less and at the rate of 3% on any amount of each bill in excess of $3.00.

If a bill is unpaid 30 days after the date of the bill, the Department of Water Works reserves the right to discontinue the service without further notice and add to the bill a sum of $1.00 for reconnection charges, all of which must be paid in full before water is turned on.

All service furnished outside the corporate limits of Michigan City, where the communities are now being served by city water through water mains installed and paid for by that community, are charged at the same rates as inside the corporate limits of Michigan City, plus 20% except where the service is furnished for private fire protection, public fire hydrants and where the consumer uses 100,000 cu. ft. or more of water per month, in which case they are charged at the same rates as applying inside the corporate limits of Michigan City.

If a consumer desires to have his water meter tested, he must deposit a fee with the Department of Water Works, which will test the meter. The fees are:

1"	$ 2 00
1" to 1½"	4 00
2"	6 00
3"	15 00
4"	25 00
5"	35 00
6"	50 00

A water meter is considered accurate if on test it registers not to exceed 2% more or less than the actual quantity of water passing through it. If a meter is found to be "fast," the Department credits the consumer with a sum equal to the per cent "fast" multiplied by the amount of all bills incurred by the consumer within the 3 months prior to the test. If the meter is "slow," the Department collects from the consumer the sum equal to the per cent "slow" multiplied by the amount of all bills incurred by the consumer for the prior 3 months period. When meters are found to be inaccurate, the Department gives credit on the next water bill or bills for the amount deposited for the test, but if the water meter on test is found to be accurate within 2%, the fee is retained by the Department to cover the expense of making the test.

Persons or firms wishing a new water-service connection make written application to the Department of Public Works, on special forms setting forth the location of the premises to be supplied and the uses for which water is desired. Before each applicant is furnished with a service connection, he is required to pay a service charge as follows:

Size of Tap and Service	Charge
¾"	$ 6 00
1"	9 00
1¼"	12 00
1½"	15 00
2"	30 00
3"	50 00
4"	75 00
6"	100 00

This schedule covers the installation of service lines for commercial and domestic use and only to consumers within the corporate limits of Michigan City. On service lines for fire protection within the city, this schedule applies for tap charges, and any installation beyond the tapping or control valve at the main is done on a time and material basis.

Consumers desiring services outside the city make a similar application and must pay in advance the tap charges outlined in the above schedule and all costs for installing the service line from the tap to and including the curb stop and curb box; provided, however, that the community in which the service is desired is being served by city water through water mains installed and paid for by that community.

All service connections made by the Department of Water Works up to and including the curb stop and curb box, together with the service connections, remain the property of the Department of Water Works and are maintained by it. Also, all meters are furnished and installed by the Department at its own expense.

A consumer wishing to have a water service shut off for any reason must have it done by an employee of the Department of Water Works, in which case the water is shut off at the curb box for a charge of $1.00. Where it is impracticable to do this and the water must be shut off inside the building and the pipe connections broken, the $1.00 turn-off charge is made plus an additional charge of $1.00 for turning on the water and including the unsealing of the lines and reinstalling of the meter.

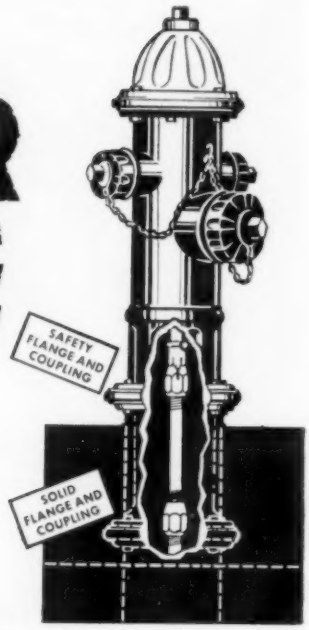
A charge of $50 per year is made for each public fire hydrant connected to the water lines, and where privately owned, $30 each per year.

A charge of $1.00 per circular inch of service line connecting to the mains is made for fire services or automatic sprinkler service.

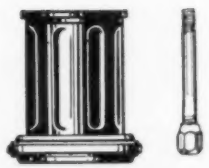
H. J. Draves,
Superintendent, Department of Water Works.

All water rates published in this series in 1940 will be reprinted at end of year.

PROVIDE FOR THE FUTURE

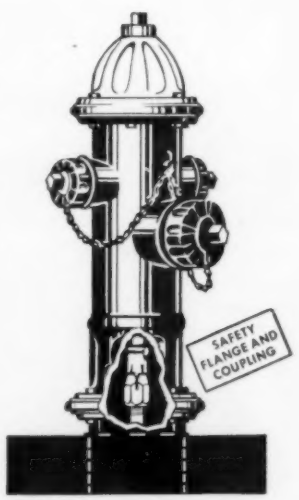


After the original installation, many cities find it necessary to raise the grade levels of their streets. With the ordinary hydrant, this results in it being too short with either the nozzles being submerged below the ground level or so near the ground that it is impossible to swing the wrench to remove the nozzle caps.



Extension section

Note how quickly and simply the construction of the Mueller-Columbian Fire Hydrant overcomes this difficulty. The Safety-Flange merely unbolted and the upper barrel section and upper stem and safety couplings removed. A new extension section of the barrel and stem is then inserted, the Safety-Flange again attached and the hydrant is again in service. It takes just a few minutes time as no water cut-off or digging is necessary.



Any Mueller representative can show you other money saving features of this advanced fire hydrant. Ask him for full details.

MUELLER CO.

CHATTANOOGA, TENN.

Raleigh, N. C.

Present population	50,000
Population served	58,000
Number of active services	9,791
" " meters	9,791
" " hydrants	770
Miles of water main	134.1

The water rates inside of the city of Raleigh, which carry a minimum monthly charge of $1.00, permitting the use of 3,333 gals., are:

First	25,000 gals.	@	$.30	$ 7.50
Next	25,000 "	@	.28	14.50
"	50,000 "	@	.26	27.50
"	100,000 "	@	.23	50.50
"	150,000 "	@	.19	79.00
"	150,000 "	@	.17	104.50
"	250,000 "	@	.14	139.50

Balance $.13 per 1,000 gals.

The rates charged outside the city, having a minimum charge of $1.33 per month, allowing the use of 3,333 gals. of water, are:

First	25,000 gals.	@	$.40	$10.00
Next	25,000 "	@	.37	19.25
"	50,000 "	@	.35	36.75
"	100,000 "	@	.29	65.75
"	150,000 "	@	.24	101.75
"	150,000 "	@	.20	131.75
"	250,000 "	@	.18	176.75

Balance $.17 per 1,000 gals.

All services are installed by licensed plumbers. The Water Department charges from $6 to $22, depending on the size, for tapping the city water mains for new services.

There is no charge for public or private fire hydrants nor for sprinkler heads for private fire protection.

E. B. Bain,
Superintendent, Water Department.

Fort Worth, Texas

Present population	180,000
Population served	175,000
Number of active services	44,434
" " meters	44,434
" " hydrants	3,022
Miles of water main	458.65

The monthly water rates for water used are:

First	2,000 gals. or less	$.75 minimum	
Next	373,000 "	.24 per 1,000	gals.
"	300,000 "	.20 " "	"
"	325,000 "	.16 " "	"
"	1,000,000 "	.12 " "	"
"	3,000,000 "	.08 " "	"
"	40,000,000 "	.07 " "	"

A monthly minimum service charge per month or fraction is made for each connection with the city water main. The service charge is based on the size of the service as follows:

⅝" or ¾"	$ .75
1"	1.00
1¼"	2.25
1½"	3.00
2"	5.00
3"	10.00
4"	15.00
6"	30.00
8"	45.00
10"	60.00
12"	90.00

Applications for services must be made at the commercial office and then be investigated and reported on by the Engineering Division of the Water Department. The applicant is notified either by telephone or by letter that the application has been accepted. The charges for services of various sizes in unpaved and paved streets are as follows:

	Unpaved	Paved
¾"	$20.00	$40.00
1"	25.00	45.00
1½"	40.00	60.00
2"	50.00	70.00

Larger services are estimated, and a deposit is required in accordance with the estimate.

There are no rentals charged for either public or private fire hydrants nor for sprinkler heads for private fire protection.

Lewis A. Quigley,
Superintendent, City Water Works.

Glendale, Calif.

Present population	80,700
Population served	81,000
Number of active services in city	20,215
" " meters in system	20,295
" " hydrants	1,393
Miles of water main	247.76

The rates for water supplies to consumers within the city of Glendale are as follows:

First	10,000 cu. ft. per mo.		$.13 per 100 cu. ft.	
Next	40,000 " " " "		.11 " " " "	
"	50,000 " " " "		.09 " " " "	
"	100,000 " " " "		.07 " " " "	
"	" " " "		.06 " " " "	
Over	300,000 " " " "		.05 " " " "	

The minimum monthly rates for water consumed are as follows:

⅝", ¾", and 1" meters	$1.00 per month
1½" meters	1.50 " "
2" "	2.00 " "
3" "	3.00 " "
4" "	4.00 " "
6" "	6.00 " "

A separate meter is placed on each separate connection, and the rate paid by a consumer is computed separately for each meter. All water bills are due on the date of the meter reading and, if not paid within 15 days, are considered delinquent, and the service of water to the installation for which the bill is delinquent, and all other services received by the same consumer, are subject to disconnection and discontinuance without further notice. Where a service is disconnected for non-payment of bills, it is not reconnected for the same consumer except upon payment of the whole amount of the delinquent bill. Where the water service has been shut off for non-payment of charges or other non-compliance with the water ordinance, $1.00 is collected for the expense of renewing the service, provided, however, that if the occupant of the premises turns on the water, a charge of $5.00 is made by the Department.

The rate for water delivered to consumers outside the city of Glendale is as follows:

Each ⅝" or ¾" meter, with an allowance of 600 cu. ft. of water or less, per month, $1.50
Each ¾" meter, with an allowance of 700 cu. ft. of water or less, per month, $1.75
Each 1" meter, with an allowance of 800 cu. ft. of water or less, per month, $2.00
Each 1½" meter, with an allowance of 1,000 cu. ft. of water or less, per month, $2.50
Each 2" meter, with an allowance of 1,200 cu. ft. of water or less, per month, $3.00
The rate for the first 5,000 cu. ft. of water furnished in excess of the allowance at the minimum charge shall be 16c per 100 cu. ft. per month.
The rate for all water furnished in excess of the first 5,000 cu. ft. and the allowance at the minimum monthly charge shall be 13c per 100 cu. ft.

Each consumer applying for water service is required to deposit cash estimated to cover 2 months' bills for the water to be supplied. No water is supplied until the deposit is made, and no deposit is accepted for less than $2.50.

The rates charged for installing services within the city of Glendale, and which must be paid by the consumer before the service is installed, are as follows:

Each	¾"	service with	⅝"	meter	$15.00
"	¾"	" "	¾"	"	18.00
"	1"	" "	¾"	"	20.00
"	1"	" "	1"	"	26.00
"	1½"	" "	¾"	"	35.00
"	1½"	" "	1"	"	41.00
"	1½"	" "	1½"	"	57.00
"	2"	" "	1"	"	46.00
"	2"	" "	1½"	"	62.00
"	2"	" "	2"	"	79.00

" service connection larger than 2", cost of installation thereof.

The rates for installing services outside the city of Glendale, which must be paid by the consumer before the service is installed, are:

Each	¾"	service with	⅝"	meter	$40.00
"	¾"	" "	¾"	"	45.00
"	1"	" "	1"	"	55.00
"	1½"	" "	1½"	"	97.50
"	2"	" "	2"	"	122.50

No charge is made for the installation and maintenance of public fire hydrants. The rate for the use of water for independent private fire lines used exclusively for fire protection, whether the line is connected to automatic sprinkling systems or to hose attachments, are as follows:

Each 2" fire line per month	$1.00
" 3" " " "	1.50
" 4" " " "	2.00
" 6" " " "	4.00
" 8" " " "	5.00

P. Diederich,
Superintendent, Water and Light Department.

Flagstaff, Ariz.

Present population	5,016
Population served	6,500
Number of active services	1,235
" " meters	1,235
" " hydrants	109
Miles of water main	34

The water rates for consumers within the city limits of Flagstaff are:

First	1,000 gals.	$2.00	
Next	50,000 "	.50 per 1,000	gals.
"	50,000 "	.40 " "	"
"	100,000 "	.30 " "	"
"	799,000 "	.25 " "	"
Excess		.22½ " "	"

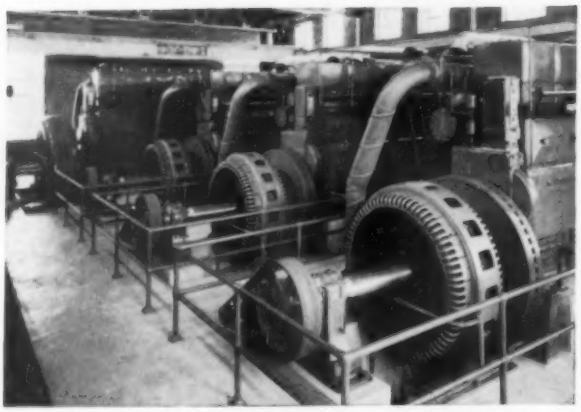
The minimum charge for water consumed is $2.00 per month per customer. Ordinance No. 166 provides that water bills for any calendar month must be paid on or before the 10th of the month following, or the water is shut off and a penalty of $1.50 collected before the water is again turned on.

New customers are required to make a deposit of $5.00 before the water is turned on. New taps with the services and the meter are installed at $10.00 each for a ¾" tap and service.

There are no hydrant rentals for either public or private fire hydrants and no special charges for sprinkler heads for private fire protection, as all fire services are metered.

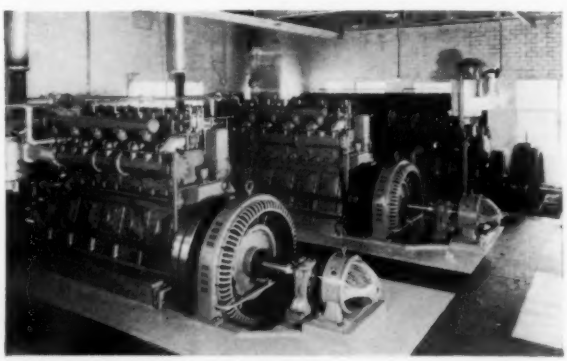
Hayes Wiedner,
Superintendent, Water and Sewer Department.

Worthington Diesel and Gas Engines for Municipal Power Service



A 2500 horsepower Diesel municipal power plant

IN power and light, water works and sewage disposal plants, Worthington engines are delivering low cost power. Maintaining high operating efficiency and uninterrupted performance over years of service, they are bringing real earnings. In your plant the same possibilities may exist.



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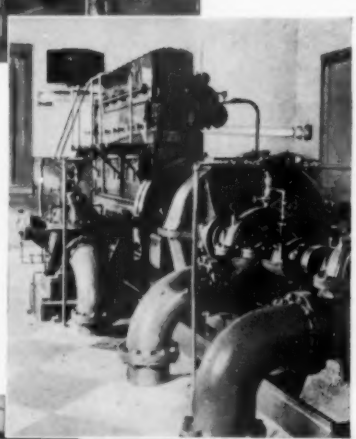

At right . . . A 280 horsepower Diesel engine driving centrifugal pumps in a municipal water works

An 800 horsepower gas engine, operating on natural gas, generating power and light for a large hospital

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Forward Steps

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Awards for Outstanding Local Architectural Excellence

BALTIMORE, MD. — Announcement was recently made by the Baltimore Association of Commerce that, beginning with the year 1940, certificates of award for good design in architecture will be awarded to architects and owners of properties. In the early fall of this year the winners in five of seven classifications of buildings erected and completed in Baltimore during the year 1939 will receive these certificates emblematic of outstanding achievement in architectural design. The presentations will take place at a general membership meeting of the organization.

The Association of Commerce decided upon the architectural awards to stimulate an improvement in the design of buildings being erected in Baltimore. A special committee of the Association made an exhaustive study of the proposal, taking into consideration the experience of other cities which had been active in this field, and concluded that the awards would be a desirable community undertaking.

In accordance with the committee's recommendations, the following general rules were adopted for the competition:

(a) That the award be annual unless otherwise determined by the Committee in charge of the event; the first award to be made in 1940 for buildings completed in 1939.

(b) That awards be made according to the following seven classifications:

1. Apartments, including group houses
2. Row houses
3. Factories
4. Retail commercial buildings, including theaters
5. Non-retail commercial buildings, including garages
6. Altered façades, meaning the alteration of entire fronts of buildings
7. Other outstanding structures, not including private residences

(c) That buildings for Federal, state, and municipal governmental agencies shall not be eligible for awards.

(d) That eligibility for the awards be limited to buildings erected within the corporate limits of Baltimore City.

A Judges Committee of five persons was selected. Dr. Douglas H. Gordon, of the Municipal Art Society, was chosen as Chairman of the Jury on Awards at its first meeting. Other members were Joseph A. Brown, of the Building Congress and Exchange; Mrs. Daniel Baker, Jr., of the Women's Civic League; Louis Justement, of the Washington Chapter of the American Institute of Architects; and William D. Lamdin, of the Baltimore Chapter of the American Institute of Architects.

In considering the various properties, the Jury took into account the following factors: exterior design; suitability of exterior to use; artistic and practical use of materials; and adaptability to site and neighborhood.

After considering all of the properties submitted in this year's competition, the Jury of Awards selected winners in five of the seven classifications, but decided not to award certificates in the other two groups — Non-Retail Commercial Buildings, Including Garages, and Altered Façades (meaning the alteration of entire fronts of buildings).

In the row-house classification, the Jury took into account the appearance of the street as a whole. Its report pointed out that while some of the row houses given honorable mention were as well designed in group units as the houses selected for the award, the appearance of the latter as a whole was superior, there being more variation in their treatment and less monotonous repetition in the use of doorways and roofs.

The Jury, in its report, stated that there were other buildings examined which had considerable merit and were entitled to recognition for good design and construction, although they did not quite meet a sufficiently high standard for awards. In these instances, the Jury recommended that honorable mention be given to certain properties.

W. G. EWALD,
Secretary, Baltimore Ass'n. of Commerce.

LAWRENCE MENEFEE, ARCHITECT; WELCH CONSTRUCTION CO., BUILDER; PHOTO BY ZEPP
These row houses received one of the architectural awards

Transformation of Waterfront Follows Hurricane Havoc

NEW LONDON, CONN.—The disastrous hurricane which visited New England in September, 1938, left New London, like many other cities, with a dual problem of reconstruction and finance. The city's government had long been committed under the council-manager plan to a policy of rigid economy and a sound financial set-up which included a balanced budget and an amortization of all municipal indebtedness.

The hurricane, with the accompanying high tide which brought huge seas pounding against the New London shore line, completely wrecked one section of the city known as Ocean Beach. This section, which was first settled as a summer cottage colony about 40 years ago, had grown into an overcrowded community which had been a police and health problem for 15 years, and was called by many visitors a beach "slum." The proverbial "ill wind" of the hurricane brought good to New London in that the City Council and an Advisory Board courageously brought out a plan to purchase the entire section and develop it as a municipal bathing and recreation park, keeping within the charter of the city, which set up the City Manager as the chief executive officer. The City Council is the policy-making body, and the State Legislature passed on act in 1939 creating the Ocean Beach Park Board, with similar powers for Ocean Beach Park.

This Board was charged with the purchase of all the properties and the

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development of the beach and park and the general policies under which it operates. The City Manager is its chief executive officer, and, much to his surprise, has found himself in a million-dollar recreation business.

During the year 1939, title to over 200 parcels of property, including land, wharfage rights, riparian rights, dwelling houses, stores, restaurants, bath-houses, and other structures, was acquired at a cost of almost $2,500,000.

Contracts amounting to $1,000,000 were signed to include razing of buildings, pumping hydraulic fill to raise the level of the 50-acre area 5 feet above storm tide, and the completion of the boardwalk, service building, bath-house, games area and playgrounds, 15 acres of parking field and other facilities which are of the most modern design and style and have caused Ocean Beach Park to be called "a half-scale Jones' Beach Park."

By pushing contractors, builders, and other construction engineers to the limit, a year's construction work was completed in 6 months, and the Park was opened on June 30 with 60 per cent of its facilities complete. The operations staff under the City Manager worked under difficulties for the first month, as contractors rushed the remainder of the job to completion. The attendance at the park has shown a steady increase directly proportional to the completion of the additional facilities, and the public has shown its appreciation by using all the facilities and having patience as the contractors completed their work.

A notable feature is the sound system serving a full half-mile of crescent-shaped beach with its 30-foot boardwalk, adjoining recreational pavilions, and the 165-foot Olympic Pool. This installation, said to be more elaborate than any other outdoor public address installation in the United States, was manufactured by Western Electric.

To finance the plan, which was submitted in an elaborate report on Restoration, Expansion and Development of Ocean Beach, New London, Conn., by A. Kenneth Morgan and W. Earle

After the Hurricane

Features of the Reconstructed Ocean Beach Park, New London

The New Development of the Waterfront at Ocean Beach, New London, Conn.

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Andrews, New York architects-engineers, the city borrowed $3,500,000 in two bond issues—one for Ocean Beach Park alone, the other for improvements of water, sewers and other facilities throughout the city. The loan carries the guarantee of the full faith and credit of the city of New London, and a great compliment was paid to the municipality for its financial policies in the case with which the bond issues were sold and the low interest rate obtained. Both of the bond issues referred to were sold at a coupon rate of 2 per cent, with a premium of $71,015. The premium will more than cover the interest for the first year, or the period of construction. It has been estimated by the architects-engineers that the revenue from the completed project at Ocean Beach Park will be sufficient to take care of operating expense, interest charges and amortization of that particular bond issue over a period of approximately 30 years. The interest and amortization of the bond issue for the elimination of stream pollution will be covered by general taxation.

The park has put the city manager plan to an entirely new test, in that its operation of the park is a separate unit designed to be self-supporting. It is too early to predict accurately the outcome of the first season's activities, for the park had operated in full capacity only two weeks when this article was written. During June it was closed entirely, and for three weeks in July only half of its facilities were open. Nevertheless, the income indicates that the estimate of the architects-engineers, which included an operating loss for the first and second years, is not far from correct. It also indicates that their estimate of the gradual increase in patronage which will bring the operating of the park out of the red by the third year is likely to be correct.

It also has demonstrated the flexibility of the council-manager plan, and the fact that a New England city does not merely "complain about the weather," as Mark Twain said, "but does something about it."

JOHN W. SHEEDY,
City Manager.

The Constant Defense of Fitchburg

FITCHBURG, MASS.—July 4 this year was declared National Defense Day by Mayor Alfred Woollacott of this city. The municipal celebration began with a huge bonfire built by employees of the Public Works Department and lighted at 10 P. M. July 3. At 10 A. M. on July 4 a street parade was staged, and at 10 o'clock that night there was a display of fireworks.

The parade presented features of great public interest, in which the Public Works Department took an enthusiastic part, as shown by the float constructed by Department employees, stressing the continuous municipal defense furnished to the citizens.

One of the large Public Works trucks was used with a 20-ton trailer. To the front of the truck was attached a V plow bearing the inscription, "Snow Our Greatest Enemy. Over 150 miles of Street to Plow." The body of the truck carried a display from the sewage disposal works, where a U. S. Weather Bureau station is also operated. Such instruments as recording thermometers and rain-gage were shown, and large bottles containing samples of sewage before and after treatment.

At the front of the trailer a full-length 8-inch water pipe was mounted on a pair of old wagon wheels properly camouflaged with evergreens to represent a heavy gun. On the barrel of the pipe was inscribed, "Safety First—Drink Water."

On the trailer itself a long trench was displayed and a group of men were shown laying a sanitary sewer. The accompanying sign read, "In the Trenches," and below, "Sewers," thus representing the service rendered by these men in the prevention of disease by proper sanitation. The street where the men were supposed to be working was closed at the end by a barriet bearing the sign, "Quiet—Men Resting," and over the lanterns, "Blackout." A street sign denotes Fourth Avenue and Independence Street. There was also a street light with a lamp burning from a storage battery.

In 1936 and 1938 Fitchburg experienced two very severe floods, during which many people had to be removed from their homes in boats to places of safety. The service performed by the Department at such times of emergency was represented on the float by an attractively painted boat. On each side of the float was a large sign headed, "Public Service by Your Public Servants," and listing the numerous services: Streets, Sewers, Sidewalks; Sewage Disposal; Water; Fences; Snow Removal; Ice Control; Street Lighting; Refuse Collection; Street Signs, Engineering; Emergencies; Floods, Hurricanes.

Our float was greatly approved by the crowds because of its originality and humorous nature. This contribution to the parade was gladly made as a privilege in harmony with municipal and civic duty.

JOSEPH M. PEIRCE,
Commissioner, Department of Public Works; City Engineer.

The Float of the Public Works Department in Fitchburg's National Defense Day Parade

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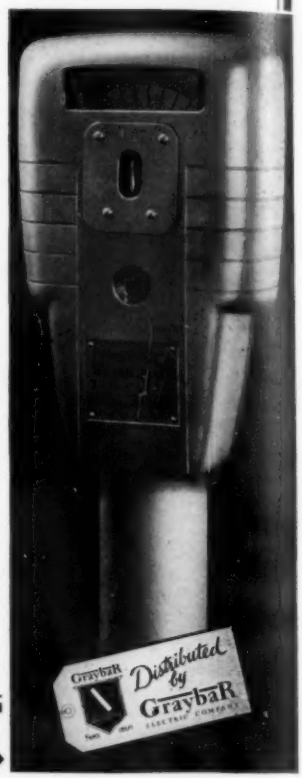

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Keep Today's Traffic Moving

By Merwyn A. Kraft
Accident Prevention Engineer, American Transit Association, New York City

". . . the real problem is that of transportation—in other words the safe and rapid movement of persons and merchandise. Accidents are one index of inefficiency and congestion is another." This was said at the 1940 Annual Convention of the American Road Builders' Association following a reference to the city street as "without doubt the weakest link in highway systems of today."[1]

This is the "real problem" facing all city officials responsible for handling traffic. The people of *today* should not have to wait until the artists' conceptions of super-highway and skyway systems reach practical fulfillment in the City of the Future and the Highways of Tomorrow. Today's people must go downtown and return home today. Why not energetically and sympathetically apply measures for reducing traffic congestion and accidents?

Traffic authorities have *not* by any means exhausted all possible remedies for present-day difficulties. Numerous proved solutions have never even been tried in many cities. These include street markings, laning streets, marking pedestrian crosswalks, outlining parking spaces, painting limit lines; modern and uniform traffic signs; timing of traffic signals on the basis of up-to-date traffic volumes, and timing for progressive movement more generally; more intensive control of parking regulations; development of off-street parking facilities; use of staggered business hours; stricter control of cruising taxicabs; and channelization.

Making these improvements is recognition that the major responsibility is moving *people* and merchandise in private automobiles, in street cars, in trucks, in buses, on bicycles or on foot. The vehicles only represent the several modes of street transportation. For example, in Detroit, although street cars and motor-buses accounted for only 5.1 per cent, while passenger automobiles and taxicabs accounted for 80.0 per cent of all *vehicles* entering and leaving the central business district, these transit vehicles carried 68.9 per cent of the persons accumulated within the district at the peak period, while passenger automobiles and taxicabs carried only 31.1 per cent of the persons.[2]

Vehicular traffic, composed of these varied classes of vehicles, has many common characteristics, and many traffic improvements benefit all types equally. On the other hand, many differences in their operating requirements make it necessary to give individual consideration to the problems of each. When doing so, all traffic improvements should be weighed on the basis of how they will affect the rapidity and safety of movement for the majority of *persons*—not just the majority of *vehicles*.

An everyday occurrence illustrates this. It is a case of a street-car line operated on a street of normal 50-foot width with parking permitted along both curbs. Outbound during the evening rush hour, a street car carrying 95 passengers is stopped because a truck has double-parked without allowing clearance room for the street car. The delay while the truck is moved is sufficient to cause 12 private automobiles carrying 28 passengers to accumulate behind the street car. Thus, because the truck does not have curb space for unloading merchandise, 13 vehicles and 123 persons are delayed and also exposed to certain accident hazards. All this results from granting the convenience of curb parking to one or two private automobiles carrying two or three or four persons.

Since traffic authorities are interested primarily in moving persons on the present street system, and since the majority of persons moving in and out of our urban central business districts every day are transported by mass carriers—street cars, motor-buses and trolley coaches,—let us review some of the simple, commonplace, *practical* methods which can be used *now* for increasing the rapidity and safety of their movements. The following observed examples illustrate the fact that *anything done to facilitate the movement of mass transportation or transit vehicles will correspondingly facilitate the collective movement of all other vehicular traffic*, with resulting service to the best interests of the community.

Example 1.—No Curb Bus Stops Provided

The Case: Motor-buses are not allotted any curb space for loading and unloading within the central business district, although they carry a large proportion of all persons entering and leaving the district. Furthermore, parking is permitted along curbs immediately adjacent to all crosswalk areas.

The Problem: Buses effectively halt all movement of vehicular traffic in two of the available four moving traffic lanes on the main business and shopping street at every intersection where buses may be called upon to stop. Automobiles and trucks parked along the curb next to all pedestrian crosswalks force the buses to load and discharge passengers within these crosswalk areas. (See Figure 1, p. 99.) This parking practice also creates hazards for the heavy pedestrian flows by blocking the vision of vehicle operators as they approach.

The Answer: The city authorities should allot adequate curb space—at least 80 feet for one bus and 115 feet for two buses—back from the crosswalk on the near sides of the intersections. The zones should be marked accurately and clearly by signs and by distinctive curb paint markings. Furthermore, these bus stop zones should be kept clear of all other vehicular traffic, especially during peak-load periods, and a prohibition of parking for a distance of 30 feet from the crosswalk areas on the far side of all intersections should be enforced rigidly.

The Result: Buses will be able to pull *completely* and *quickly* into the

[1] "Highway Economics and Design Principles."—Maxwell Halsey, Associate Director, Bureau for Street Traffic Research, Yale University, New Haven, Conn.

[2] Data from a report on "Street Traffic, City of Detroit," published by the Michigan State Highway Department.

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curb and out of the moving lane of traffic when required to load or discharge passengers. Other vehicular traffic will be able to move freely without the present undesirable and unnecessary delays. Also, with the additional free area at the far sides of the intersections, buses will be able to maneuver back into the moving traffic stream more easily and more safely. Thus, by sacrificing a relatively small proportion of the total curb space which inconveniences only a few individuals, the rapidity and safety of movement is increased greatly for all vehicles, to the benefit of the great majority of persons.

Figure 1

Example 2.—Insufficient Length for Bus-Stop Zones

The Case: Curb loading zones 50 feet in length are established at the near sides of intersections within the central business district for the use of motor-buses and trolley coaches in loading and discharging passengers. A single sign back of the curb near the crosswalk establishes the restrictions without any further distinctive marking.

The Problem: Fifty feet of curb space does not provide sufficient area to permit modern trolley coaches and motor-buses with seating capacities of 30 passengers or more to pull completely out of the moving traffic lane to within the desired one foot of the curb easily and quickly. As a result, the transit vehicles may follow any one of three practices. They may only nose into the curb, leaving the rear of the bus to interfere with free movement of other traffic. They may not even try to pull in to the curb when parked vehicles have encroached upon this already limited zone. They may pull completely in to the curb, but in doing so the operators must slow the vehicles to a very low operating speed, and their judgment of the rear right clearance must be very accurate. In all cases, free movement of vehicular traffic is interfered with seriously, and many accidents — rear-end collisions, side-swipes and clipping fenders of parked vehicles—occur as direct results.

Figure 2, below, clearly illustrates one of the problems. An automobile double-parked in mid-block forced the trolley coach out into the center lane of moving traffic; an automobile parked within the limited curb loading zone made it impossible for the coach to pull completely in to the curb; the passenger seeing the coach in the center lane stepped out to attract the operator's attention, thereby preventing him from even pulling back to the outside moving lane. These circumstances — all controllable — succeeded in blocking thoroughly all other vehicles moving in that particular direction.

The Answer: The city should allot at least *80 feet* of curb space for bus stop zones, 115 feet if the zone must be used simultaneously by two buses or trolley coaches. The full limits of the zone should be indicated accurately and clearly with signs and distinctive curb paint markings. Parking within these zones should be abolished, and double-parking should be eliminated, especially at the approach end of these zones in the central business district.

The Result: The results will be the same as given for Example 1. Movement of transit vehicles will be expedited; there will be less interference to other vehicular traffic; accidents will be reduced. An inconvenience to a few individual motorists increases tremendously the value of existing transportation facilities to the majority of the street users.

Figure 2

Example 3.—Street-Car Stop Too Far From Corner

The Case: A double-track street-car line crossed a 60-foot vehicular thoroughfare on a sharp angle at an intersection controlled by traffic signals. The 75-second signal cycle was distributed as follows for the cross street: green — 17½ seconds; green-amber—5¼ seconds; amber—2¼ seconds; red—50 seconds. The inbound car stop was located 125 feet from the near-side curb line so as not to interfere with a service station entrance.

The Problem: Ten right-angle collisions with street cars occurred during a 36-month period, eight of them involving inbound trolley cars. Over $8,000 was paid out by the transit company for claims resulting from these accidents. When this intersection was studied by the transit company, it became apparent that the inbound street cars were not clearing the far curb line of the intersection before the traffic signal changed and permitted movements on the main thoroughfare even when they were started up on the "green" phase of the signal cycle. With the car stop back 125 feet from the near-side curb line, a street car had to travel approximately 225 feet before the rear of the car cleared the intersection. Under the best acceleration possible, this would consume at least 10 seconds as compared with the 7½ seconds of combined "green-amber" and "amber" clearance time allotted in the signal cycle. Even if the street car started during the last few seconds of the "green" period, it would have either to stop again suddenly before crossing or run the risk of a right-

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angle collision while trying to clear the intersection on the "amber" and a few seconds of the "red" period.

The Answer: When this condition was made known to the city authorities, they granted permission to move the inbound street-car stop approximately 75 feet nearer the intersection —to within 50 feet of the near-side curb line. In addition, instructions were given to the street-car operators by the transit operating officials that they should start up and continue across the intersection only when the "green" signal showed at the time they started.

The Result: During the 36 months since the change, no right-angle collisions have been experienced by inbound street cars. Whereas ten accidents costing over $8,000 occurred during the 36 months prior to the change, only two accidents, neither of which had any cost, occurred during the 36 months following.

Example 4.—Faulty Traffic-Signal Timing Creates Delays

The Case: Along the main street of the central business district there are eight intersections, six having traffic signals. In addition, five adjacent intersections are signalized so that within the entire district there are eleven intersections where vehicles are subject to traffic-signal control. The signals at each intersection have separate control boxes. Although operated by synchronous motors, they are not coordinated. The cycles used are as follows: two—40 seconds; two—50 seconds; three—60 seconds; one—80 seconds; three—90 seconds. The distribution of time between the movements at each intersection is based on obsolete volume data and is not in line with current movement distribution.

The Problem: Movement through or within the district without delays at unfavorable traffic signals is purely a matter of chance because of the varied cycle lengths used and the lack of coordinated timing. An extensive check on delays to buses operating through the area showed that, exclusive of stops for loading and discharging passengers, the buses spent more than 12½ per cent of their operating time stopped while waiting for a favorable traffic signal. As 65 per cent of all persons traveling in vehicles within the district are carried in buses, these delays become of considerable importance to the community as well as to the transit company. Furthermore, similar checks of private and commercial vehicle operation gave even higher time losses because of signal delays, these amounting to 20 per cent of operating time through the district.

The Answer: The traffic signals should be re-timed and a uniform cycle length used. First, a 60-second cycle should be tried, and then a cycle of 50 seconds. The distribution of intervals for the several movements at each intersection should be changed to conform with present-day volumes per available lane, and the signals should be coordinated to make progressive movement possible.

The Result: Speeds for all vehicular movements could be doubled. Whereas present average over-all speeds of private passenger vehicles are now only 8 to 9 miles per hour, they could be raised to 16 to 18 miles per hour. Correspondingly, present average speeds for buses of 4 to 5 miles per hour could be improved to 7 or 8 miles per hour through the district. This would be possible not only because stops at unfavorable traffic signals would be almost done away with, but also because other interferences and slowing of normal driving speeds would be reduced appreciably. Likewise, accidents now caused by sudden stops, weaving, and traffic accumulations should be greatly reduced.

These four examples illustrate actual traffic conditions which can be improved by known corrective measures. Countless examples could be cited. Values derived from elimination of angle parking and other bad parking practices were discussed in the December, 1939, issue of The American City; pedestrian protection, in May, 1940; medial traffic dividers, in March and April, 1940; the control of parking along the inbound side of streets during the morning peak and along the outbound side during the evening peak, in the August, 1940, issue of the magazine.

Present street traffic conditions can be improved materially by the common-sense application of known remedies. The people of today can be moved rapidly and safely on the streets of today.

More Accidents at Un-Signed, Un-Signalized Intersections

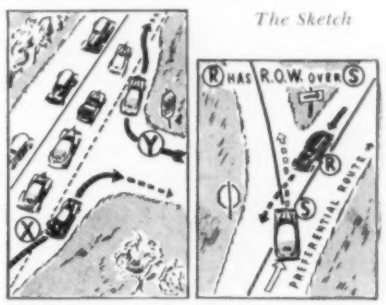
Nearly Half of last year's 24,000 reported auto-accidents in Illinois occurred at street and highway intersections, according to the Safety Bulletin of the Division of Highways.

Grade separations are the answer, but the cost makes them practical only on trunk highways. Traffic signals also help to reduce the uncertainty at intersections but they are installed only when traffic volumes meet specific requirements.

Many intersections in the state are provided with signs to protect the motorists, but the majority of them are not protected at all. It is at these intersections that most of the accidents occur. Those which are provided with signs—on boulevards, through streets, and rural state highways—have been given this protection as a result of much engineering study, and the signs must be obeyed by motorists to insure safety. Urban streets or township and county roads, without signs, place the motorists entirely on their own, and they must yield the right-of-way to vehicles approaching from their right.

Analysis of accidents at 350 rural state highway grade-intersections over a two-year period showed that nearly half were the result of stop-sign violations.

At many rural junctions of state highways, accelerating and decelerating lanes have been constructed to aid the free movement of traffic. Studies



The Sketch

of these brought out the fact that motorists are not using these lanes to the extent which was anticipated. The sketch shows the proper method for their use: Car X pulling out of traffic onto the decelerating lane to make a right turn, and Car Y, after stopping at the sign, pulling to the right into the accelerating lane to merge into its place in traffic without interference with other vehicles. The proper use of these lanes not only avoids congestion at intersections but is also a measure of safety.

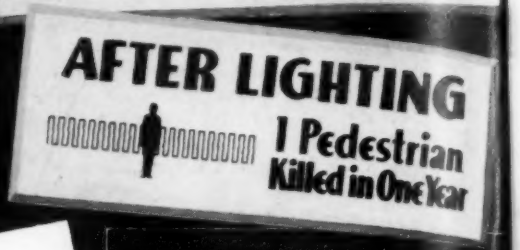
Another fact disclosed by the study of intersection accidents was the frequency with which angular type head-on collisions occur at "Y" type junctions. A right-of-way problem arises when a motorist turns from the preferential route. In the example at the right in the illustration, driver S should yield the right-of-way to R because: (1) applying the basic right-of-way rule, R is to the right of S; (2) S must cross the traffic lane of R obstructing the straight ahead course of S; (3) R is operating on the preferential route while S is maneuvering off and should yield to through traffic. Of course, if the lane in which R is traveling is under stop-sign control, S would then have the right-of-way.

NEW JERSEY

WITH AMERICA'S HEAVIEST TRAFFIC

CHEATS DEATH

WITH AMERICA'S SAFEST HIGHWAYS



HIGHWAY-SAFETY lighting eliminated 90 per cent of the fatal pedestrian night accidents on the White Horse Pike, longest continuously lighted highway in the United States, during the first year after the installation of modern illumination, the New Jersey State Highway Department announced recently.

Between July 1, 1938, and July 1, 1939, when highway lighting was in operation on this 50-mile stretch, which passes through 22 municipalities, there were more than 6,000,000 car-miles traveled with only *one pedestrian night fatality,* in contrast to ten deaths in a previously reported 12-month period. Together with other proved safety measures, traffic-safety lighting reduced *all* night accidents 56 per cent.

This is typical of safety records on lighted highways all over the State. The reduction in injuries and deaths at night as a result of the New Jersey State Highway Department's program providing State Aid to counties and municipalities for safety lighting, inaugurated by State Highway Commissioner E. Donald Sterner several years ago, has been accomplished at a nominal cost per person saved from serious injury and death.

General Electric is proud of the part that it has played in helping reduce the accident and death rate on New Jersey's highways. Specify G-Ξ safety-lighting equipment. You then enlist the experience that our engineers have acquired on hundreds of lighting projects—on highways, streets, bridges, tunnels, dangerous intersections, and rail crossings. General Electric, Schenectady, N. Y.

TRAFFIC-SAFETY LIGHTING

Experience in New Jersey has proved that lighting of the known traffic-accident zones provides the maximum of safety for the minimum expenditure. Night traffic moves swiftly and safely on lighted highways, with adequate visibility for both motorist and pedestrian.

TRAFFIC SIGNALS

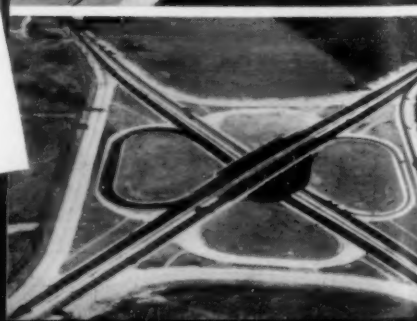
Safe movement of traffic through street and highway intersections is assured by traffic signals which give clear, unmistakable indications in bright sunlight, fog, or darkness.

DIVIDED HIGHWAYS

Divided highways prevent friction between fast-moving vehicles. Curbs are designed to be surmountable, and the recent development of light-reflecting curbs is adding extra visibility to reduce the hazard of the curb itself.

TRAFFIC CIRCLES

The first clover-leaf traffic circle was constructed in 1928 to expedite the movement of heavy traffic. Proper lighting makes direction signs stand out distinctly at night.



GENERAL ELECTRIC

454-3

Outdoor Lighting

Streets—Highways—Floodlighting

Traffic Safety Lighting

An Opportunity for Public Service

By L. A. S. Wood
Chief Lighting Engineer,
Westinghouse Electric & Manufacturing Company

Above and below is the same heavy traffic street in Cleveland, Ohio: above, "conventionally lighted" with 15,000-lumen lamps in upright luminaires mounted 18 feet high and spaced 125 feet apart; below, the same as above except that the 15,000-lumen lamps are now in new pendent luminaires lifted to 25 feet mounting height

IMPROVEMENTS in technique have taken street lighting out of the realm of politics and assigned to it a permanent position as an essential public service

At present the annual per capita expenditure for street lighting in the United States is $1.25. Yet authorities are agreed that at least $2.25 per capita is required to provide adequate night visibility on city streets.

Since 1931 night fatalities have increased 18 per cent, while in the same period day fatalities have decreased 20 intensive safety campaigns that the intensive safety campaigns of the past decade have been more successful in reducing the day fatalities than those at night.

The Night Accident Problem

Traffic safety lighting is the practical application of the "Science of Seeing" to the night-accident problem and is based primarily on visibility. It is now recognized that objects are seen more readily by contrast than by direct illumination, and since objects in the roadway are predominantly dark in color, the purpose of traffic safety lighting is to provide a light background for objects so that they can be clearly seen as silhouettes. This is accomplished by directing the light to the road at grazing angles which render the road surface bright when viewed from the driver's seat. In "conventional" street lighting, much of the light is directed to the road at high angles, rendering the surface dark when viewed from the driver's seat.

Many cities have already reduced their night fatality rates by adopting traffic safety lighting. In Detroit, for example, there are 300 miles of traffic safety lighting on the major thoroughfares where the ratio of night to day fatalities, which under the old street lighting was 7 to 1, has been reduced to 1.5 to 1.

In 16 counties in New Jersey, when safety lighting was installed on the highways the record for 11 months before and after shows a reduction in night fatalities of 91, from 245 before relighting to 154 after.

At 25 intersections in Los Angeles where sodium warning beacons have been installed, for equal periods before and after lighting, accidents were reduced from 81 to 13, and deaths from 12 to zero.

Now that the remedy for the disproportionate night-accident hazard has been developed, it will soon be recognized that the responsibility for the continuance of the excessive night-accident experience rests mainly with public authorities who hesitate to ap-

GET *BOTH*

Effective Street Lighting

Economical Maintenance

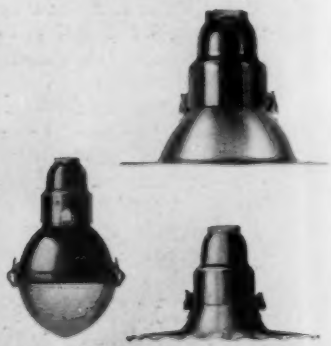
with SPHEROLITES

Spherolites combine effective lighting with easy, economical *servicing in the field* that saves you time and money. You relamp the Spherolite, clean its reflector, replace or clean its glassware *in the field* . . . no need to return the Spherolite to the factory for such replacements or repairs. Why not start now to get this economy of maintenance combined with effective lighting and longer service life that Spherolite luminaires assure.

EASY TO DETACH Spherolite glassware for cleaning or replacement in the field. Spherolite's toggle latches are easy to open, make a positive seal when closed.

EASY TO RE-LAMP the Spherolite, especially when you specify this hinge and automatic latch. Also makes it easy to clean the reflector without removing the glassware.

EASY TO SERVICE inside the hood. Supporting chain prevents detached Spherolite reflectors from dropping down while wiring, cleaning, etc.



CONVERTIBLE . . . Radial bowl and other type reflectors easily attached to Spherolite hoods without adapters. Gives your system flexibility.

LINE MATERIAL CO. MILWAUKEE, WISCONSIN

ply the remedy.

Public lighting is generally associated with white ways on business streets. The quality of the street-lighting service of an entire city is often appraised by the effectiveness of the illumination in these brilliantly lighted streets, and the inadequate lighting conditions prevailing in other parts of the community are completely overlooked.

Yet it is at the intersections on thoroughfares and residence streets and not on white ways that most of the accidents occur. A survey* of 47 American cities with a total population of 19,000,000 disclosed that main traffic thoroughfares are the most dangerous city streets, and that while representing only 10 per cent of the total street mileage they accounted for 77 per cent of all accidents and 41 per cent of all fatalities, 69 per cent of which occur at night. Most of the other fatalities occur on minor traffic thoroughfares and residence streets. Few occur on well-lighted business streets.

Most of the lighting on thoroughfares and residence streets was designed in the horse-and-buggy days. Intersections on such streets need skilled treatment to make them safe in these nights of speed and carelessness.

* Conducted by the National Bureau of Casualty and Surety Underwriters.

Sports Lighting in a City Park

By DANIEL FRANKLIN
Mayor, Oneonta, N. Y.

NEAHWA Park, owned by the city of Oneonta, has installed a sports lighting system under which the Oneonta team in the Canadian-American Baseball League plays night ball. The new system will also be used for night football. One hundred 1,500-watt floodlights developed by General Electric engineers for night sports have been installed by the city with the cooperation of local business men and sportsmen.

The night attendance has more than justified our faith. The lights used in the system are similar to those now in operation at such big-league parks as Ebbets Field, where the Brooklyn Dodgers play and at the Cleveland Municipal Stadium, where the Indians play their night games.

The primary object of the system was to enable the Oneonta team in the Canadian-American League to operate on a successful basis. This is the team's first year in the League, and city officials felt a certain responsibility in helping the club to become a success. They have agreed, if the club's earnings permit, to pay the city of Oneonta one-half of the cost of the installation of the lights. This is an interesting point which may be useful to other city officials in determining whether or not to install lights for night games at their parks under which local professional teams may play.

74 Years of Electric Street Lights

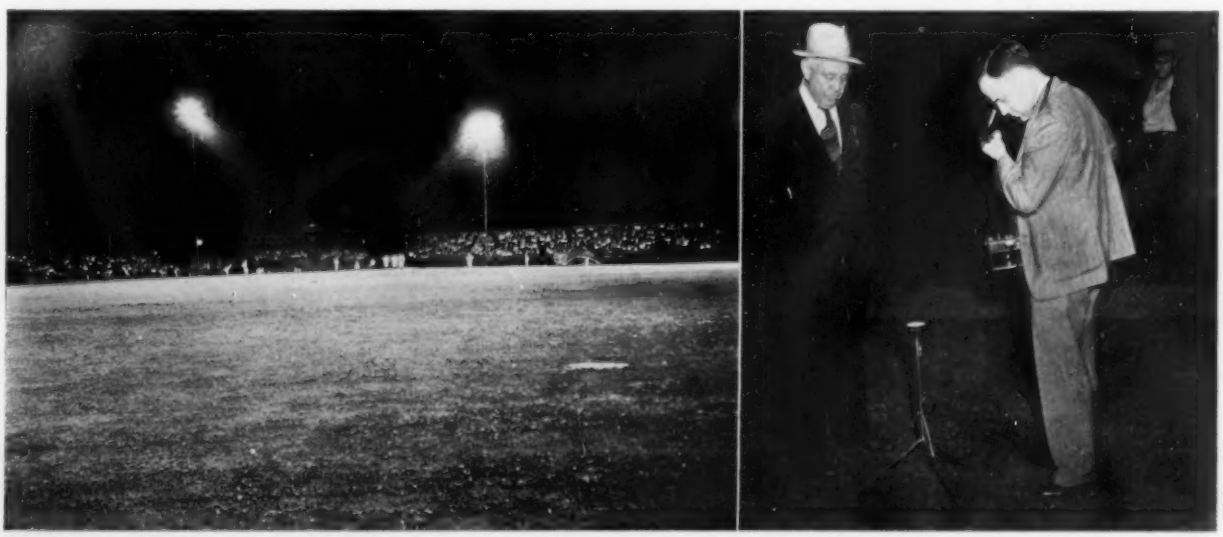
ELECTRIC STREET LIGHTING made its debut in Tacoma, Wash., in 1886 when arc lamps were installed on Pacific Avenue from South 9th to 23d Street, and on "A" Street from South 9th to 11th Street. Incandescent street lights were also introduced the same year. The gas lights that had been placed on the streets in 1885 were abandoned in favor of the electric lights. The installation of the street lights kept pace with the rapidly growing city, and 228 arc lamps were in operation by 1891.

The downtown district is now well lighted by 600 luminous arc lamps of the single-unit type on cast-iron standards. The lamps are arranged in 11 circuits fed from mercury-arc rectifiers. There are also 154 series A.C. luminaires of 1,500 cp on 77 concrete standards.

The residence districts are lighted by 5,138 ornamental units, consisting of series tungsten lamps in pear-shaped Monax globes mounted on gray concrete standards, and by 2,672 suspended or bracket lights. The ornamental street lights illuminate more than 1,700 city blocks and require 147 miles of parkway cable.

To obtain ornamental street lights, property owners present a petition to the City Council asking for the formation of an improvement district. If more than 50 per cent of the property owners favor the improvement, the installation is made and the cost distributed on the basis of property owned, varying from $16 to $25 for a lot of 25 feet frontage.

The lamps are placed 100 feet apart and staggered; thus for a 400-foot block there will be two lights on each side of



Newly lighted Neahwa Park, owned by the city of Oneonta, N. Y., with Mayor Daniel Franklin at right observing a test being made by Robert J. Swackhammer, General Electric engineer

A Bright New Page
in the History of Escanaba, Mich.

BEFORE: Above is a photograph of a business thoroughfare in Escanaba, Michigan, prior to the installation of Holophane Refractors.

AFTER: Photograph (unretouched) taken from the same point as scene at left but *after* Holophane Refractors were installed. Notice high visibility on pavement, parked cars, etc.

HOLOPHANE REFRACTORS meet the three fundamental requirements of Modern Street Lighting—Effectiveness, Efficiency, Economy. . . . They are *effective* because they *shape* the light to the street, where it is most needed. . . . They are *efficient* because they distribute *more* light to the required area, provide extra visibility and extra safety. . . . They are *economical* because they provide these plus advantages at *lower annual operating* and maintenance costs.

If you want proof of what Holophane Refractors can do for *your* community—and facts on the savings they afford—communicate with your equipment manufacturer (who recommends Refractors); or write direct to the Holophane Street Lighting Division, Newark, Ohio. . . .

• *You will find much of interest in the article from last July's issue of Public Management by Stuart M. Weaver, Executive Assistant to Director of Public Works, Montclair, New Jersey: "How to Get Better Street Lighting" . . . We'll gladly send you a copy on request.*

Holophane
COMPANY, INC. — *Lighting Authorities—Since 1898*

342 MADISON AVE.
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THE HOLOPHANE CO. LTD.
385 Yonge St., Toronto, Canada

the street. The assessments for the installation are levied according to the zone system under the state law for local improvement districts.

Annual maintenance totals $44,600, and municipal current at 1 cent per kwh amounts to $69,856, a grand total cost of $114,456, or $1.07 per capita. The street-lighting equipment is valued at $710,117.

Toledo Steps Out of Arc-Light Era

By George N. Schoonmaker
City Manager, Toledo, Ohio

THE street-lighting system in Toledo is being extensively revised during 1940 by the Toledo Edison Co. under a contract with the city signed last March. Construction now in progress should be completed early this fall.

Previous to this year, approximately 3,500 out of the total of 7,500 street lights in Toledo were arc lights. All these arc lights are being eliminated from service. The remainder are incandescent lights in luminaires of types suitable for use in residential streets. It happened that there were approximately the same number of these present incandescent luminaires in service on the city's traffic thoroughfares as were needed to replace the arc lamps located on the residential streets. Therefore, the plan being followed is to move all present incandescent luminaires on traffic streets to those residential streets which were previously illuminated by arc lamps. This has required the purchase of approximately 4,000 modern luminaires for traffic thoroughfares and business districts.

Three different forms are being used. In the primary business district, twin lights are being retained, but large-sized luminaires with a symmetric light distribution and 10,000-lumen lamps are to be used. Along traffic thoroughfares where the pavement width exceeds 40 feet, a luminaire having an asymmetric light distribution which throws a large proportion of light across the street is used, all light control being by internal reflectors; lamp sizes are 10,000 and 6,000 lumens. On the narrower traffic thoroughfares, the new luminaires make use of refracting glassware to throw more of the light lengthwise of the street; lamps are rated 6,000 lumens. Including residential streets, approximately 6,000 lights will be modernized. All twin-light standards outside the primary business district are being changed to single lights.

On practically all the traffic thoroughfares having underground supply for street lights, new 6-foot brackets of the upsweep type are used, with mounting heights increased to 22 feet 9 inches. Lights with overhead supply on traffic thoroughfares are to be at the increased mounting height where tree conditions permit. All modernized overhead lights having either 6-foot or 16-foot brackets will have the wires inside the pipe bracket, with improved appearance and reduced maintenance.

This program does not provide for any increase in the number of lights, although further changes are under consideration. It is too early to determine the effect which the new lights will have on traffic safety, but it is expected that this will be appreciable, since the average pavement illumination throughout the city will be more than doubled, and the greatest increases generally will be on the more hazardous traffic streets. The effort has been to secure the greatest improvement in illumination possible at a reasonable cost, rather than to spend money purely for ornamentation. A comprehensive study of the city's needs in street lighting, considering traffic density and similar factors, was made by the city administration before the new contract was negotiated, and the results of that study were brought together in a report of some 100 pages which has proved useful in later planning.

Street-Lighting Costs

The 600 Cities whose street-lighting costs are listed in The Municipal Index for 1940-41 pay, on the average, 95 cents per capita, $472 per mile, and 9 cents per foot of lighted street. Do you want a reprint of this table?

All But One Crash Was at Night

Twenty-five Accidents resulting in one death and 47 injuries, was the two-year record of the intersection of Lakewood Boulevard and South Street near Long Beach in Los Angeles County, Calif. *Twenty-four of the 25 accidents* had occurred at night, despite the use of four-way reflectorized signs at the intersection.

M. J. Bankhead, Los Angeles County Traffic Engineer, decided that they were caused by motorists coming upon the intersection without being able to see the stop signs in time. He recommended the installation of a sodium light and placed warning signs 400 feet in advance of the intersection stop signs.

In a 16-month period since the improvement, only two accidents have occurred at the intersection at night, in contrast with an average of one night accident every month before the light was installed.

Sodium's color and visibility take terror out of dangerous intersection

CLOSE THE WALL *Completely*

...with *Western Electric* 2-Way Police Radio

Cooperative action between Police Headquarters and officers on car patrol is often the key to crime detection or crime prevention. In many situations, one-way communication leaves a gap in the wall of police protection.

Block this last opening securely at reasonable expense with Western Electric 2-way police radio. A telephone handset puts the car that's "in action" in complete contact with headquarters. A simple "press-to-talk" switch is the only operating control.

The compact, self-contained car transmitter and receiver units are easily installed. Dependability is high; maintenance cost low. Both units operate without excessive drain from any 6-volt car battery system. The same antenna serves for sending or receiving. » » » The system operates in the ultra high frequency band (30-40 megacycles)—the headquarters transmitter delivering from 5-500 watts of carrier power to the antenna, depending on your selection of transmitter. Carrier frequency stability of .02% or better is assured by use of a quartz crystal. In operation under difficult conditions these units have further disproved the idea that frequencies above 30 megacycles are limited to line-of-sight range. Areas overshadowed by tall buildings, hilly terrain, etc. are generally covered successfully. » » » For further information on police radio systems or other communication and signaling equipment, call your local GRAYBAR office or write for bulletins. Graybar Electric Company, Graybar Building, New York, N. Y.

Improving Municipal Administration

Current Items from the Public Administration Clearing House

Municipal Control of Charity Solicitation

EFFORTS BY CITIES to control soliciting for charitable purposes may prove unsuccessful unless strong licensing and controlling ordinances are enforced at all times, according to a study by the Houston, Texas, Research Department, as analyzed by the American Municipal Association. The study was made of ordinances regulating soliciting in 30 cities in or about Houston's population bracket to determine the extent to which solicitors are controlled by permits, investigations, limits to time and expenses of soliciting, financial reports and penalties.

City ordinances covered include those of Rochester, N. Y., Akron, Cleveland, Detroit, Philadelphia, Portland, Ore., Milwaukee, Buffalo, Oakland, Calif., Denver, San Francisco, Baltimore, Boston, Pittsburgh, St. Louis, Los Angeles, Indianapolis, Chicago, Dayton, Memphis, Omaha, Dallas, New Orleans, Syracuse, St. Paul, Washington, D. C., Kansas City, Mo., Louisville and Columbus, Ohio.

An analysis of the report shows that city officials in 22 of the cities are made directly responsible for the investigation of applications for permits to solicit, while in 6 cities boards or commissions conduct the investigations or otherwise pass on the merits or demerits of proposed solicitations.

Twenty cities require detailed applications, including financial reports, budgets for expenses of proposed soliciting, and specific details of how, when, where and why the money raised is to be spent. These applications must be sworn to before a notary public.

Detailed financial information is required by 16 cities, either in the application or after solicitation is completed. Nine of these cities limit expenses of solicitation, including commissions to solicitors; and of the 9, 6 limit expenses to 25 per cent of the funds obtained. In addition to cities covered by the study, Jackson, Miss., Cincinnati and Oklahoma City limit the amount apportioned to expenses and commissions. Two cities require the posting of bond before the start of any solicitation.

Fees are charged for permits in eight of the cities, the amounts ranging from $1 in Akron to $25 in Los Angeles. Dayton's fee is 10 per cent of the amount solicited, with a minimum of $1,000. Thirteen cities place a limit on the time a permit may be used. The limit is 30 days in Akron, Portland, San Francisco, Dayton, Dallas and Columbus; three months in St. Louis and Indianapolis; and one year in Philadelphia, Oakland and Louisville. Penalties imposed by the cities for violating their ordinances range as high as a fine of $1,000 and a year in jail.

The Association points out that a number of cities refuse to issue soliciting permits to individuals, others ban "tag days" except on two or three specified days of the year, and a few flatly prohibit begging.

All cities which have established a comprehensive control of soliciting for charity report a marked reduction in the number of applications for permits, according to the Houston study.

Vacation and Hospitalization Plans for City Employees

A VACATION PLAN FOR CITY EMPLOYEES paid by the hour is one of two employee benefit programs adopted by the Bedford, Ohio, City Council recently to foster better employee relations with the city, says the International City Managers' Association. The other plan is one of group hospitalization furnished through the Hospital Service Association of nearby Cleveland, and paid for by monthly payroll deductions.

The Bedford vacation plan for hourly wage employees was adopted by the City Council by amending the city payroll ordinance, which now provides for 52 weeks' pay for 51 weeks' work. This will assure the employee a week's vacation without a loss of wages.

To assure employees of cash saved for their vacations, the payroll deduction savings plan was developed by the Bedford department of finance and a local bank. The employee designates the amount he wants deposited in the bank each semi-monthly pay period. The accounts are joint accounts with a city official, but it is understood they are entirely for the benefit of the employee.

Many employees are using the vacation savings plan to build up a savings reserve. Vacation savings may be used for emergencies or other worthwhile purposes than a vacation. The Association points out that the savings plan is similar to the municipal credit unions used by many cities in helping employees save.

Bedford is but one of several cities where city employees who work on an hourly basis receive vacations with pay. Others include Chicago, Detroit, New York City, Escanaba, Mich., Minneapolis, San Francisco and Schenectady, where skilled workers and day laborers generally are paid on an hourly basis. In Minneapolis, seasonal and intermittent employees who have been on the city payroll for five or more years, and who work on a pro rata basis six months or longer, are given vacations of one day for each month employed. In Milwaukee, city employees paid by the hour get two weeks' vacation with pay if there is no more than 30 consecutive days' intermission in employment. Otherwise they receive one day's vacation for each month worked.

Approximately 80 per cent of Bedford's city employees have joined the group hospitalization plan, and most of them have taken advantage of an optional contract providing hospitalization for members of their families at a small additional cost.

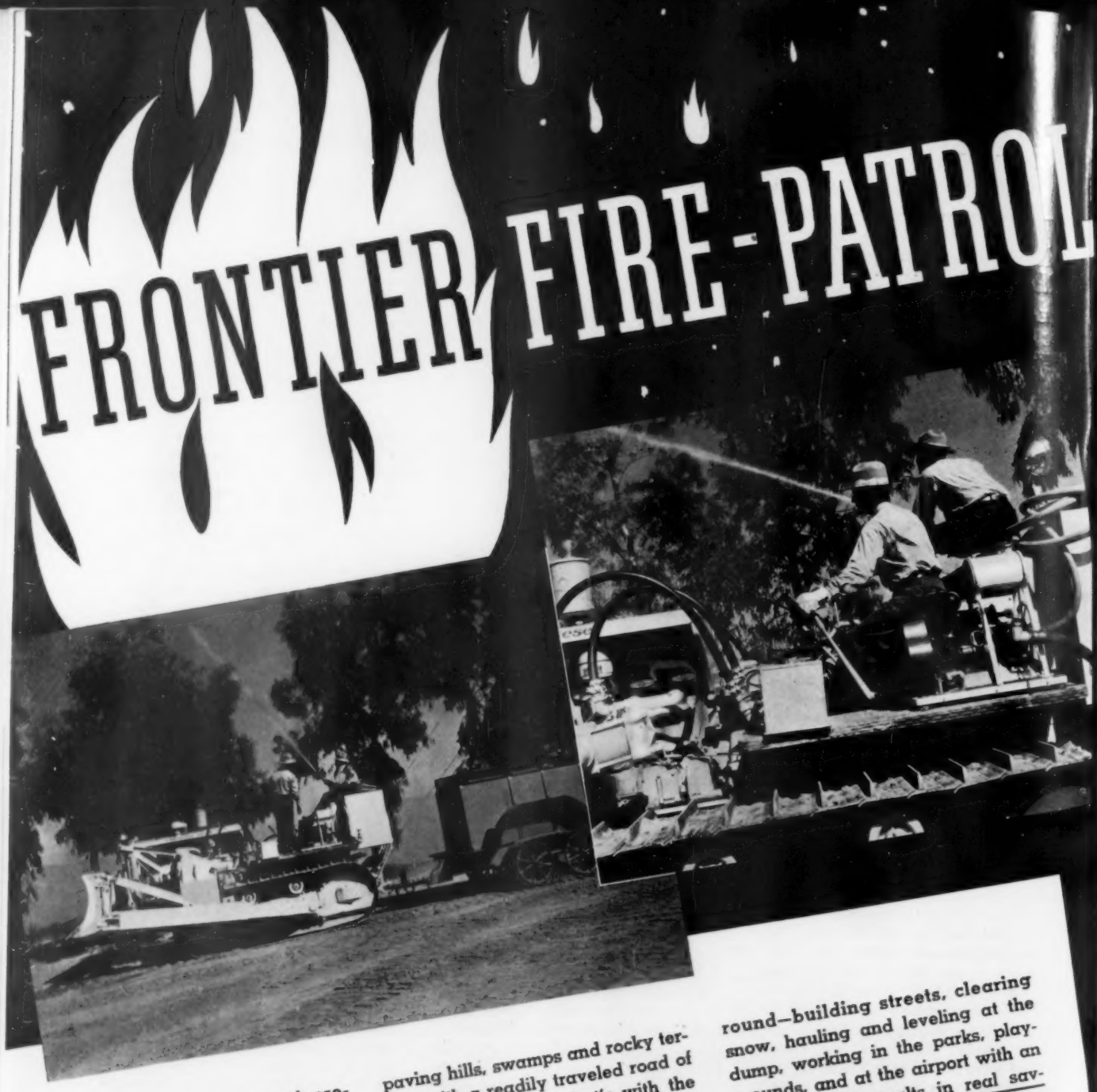
Variation in City Civil Service Agencies

THE 869 MUNICIPAL CIVIL SERVICE AGENCIES in the country are set up on a wide variety of legal bases and under many types of organization, the Civil Service Assembly of the United States and Canada has reported. Known by more than 50 different terms,—although the majority are called "civil service commissions,"—the agencies may be set up by the state constitution, by an act of the legislature, by municipal charter or by a local ordinance.

In California, for example, a city whose voters have approved a civil service charter amendment must obtain permission—usually a formality—from the State Legislature before civil service becomes effective, although cities may install merit systems by ordinance. In Ohio, the constitution requires that city civil service commissions be established for selecting employees in all municipal departments.

Provisions in the civil service acts of Minnesota, New York, Rhode Island, Tennessee and Wisconsin authorize the state personnel agencies to render technical and administrative service to local jurisdictions for a fee. In New Jersey, similar assistance from the state can be obtained without cost upon ap-

FRONTIER FIRE-PATROL



Your city parks, municipal preserves, and undeveloped outlying sections may not be a frontier in the strictest sense of the word. But they do present problems that the usual fire department equipment would find as difficult as the frontier!

The city of Los Angeles, California, has a situation like that—and meets it with this "Caterpillar" Diesel D8 Tractor converted into a fire-fighting unit. Able to head across rough, unbroken country, it can meet a blaze on its own ground. For the sure-footed tracks of a "Caterpillar" Diesel have a way of paving hills, swamps and rocky terrain with a readily traveled road of steel—and the load that's with the machine has to come along!

In this case, the load is a 450-gallon tank and pump rear-mounted on the tractor . . . and a 1000-gallon tank on a track-type trailer hooked to the drawbar. Notice that the tractor has a bulldozer for turning a wide, protective swath of earth across the path of the flames!

Though this machine would be considered part of your fire department, it can serve many other departments all year round—building streets, clearing snow, hauling and leveling at the dump, working in the parks, playgrounds, and at the airport with an economy that results in real savings to your taxpayers!

See your "Caterpillar" dealer, or write direct, for more information on "Caterpillar" Diesel equipment.

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DIESEL ENGINES AND ELECTRIC SETS
TRACK-TYPE TRACTORS • ROAD MACHINERY

proval of municipal voters.

More than three-fourths of all city civil service agencies are of the three-member type, appointed so as to provide overlapping terms and thus to further continuity of policy, according to the survey. Commissions of five members are next high in number. Most of the municipal civil service commissioners hold office for six years, and in a few cities the commissioners serve at the pleasure of the appointing authority.

Mayors make the appointments to city civil service commissions in a majority of the cities, and in the next largest group of cities appointments are made by the city councils. In some cities, the commissioners are selected jointly by city or state officials, employee and civic groups; in others, elected by the people as commissioners or named ex-officio as commissioners after election to other positions. In a few cities they are appointed by the city managers.

The Only Municipal Weather Bureau in the U. S.

A Municipally Operated Weather Bureau, believed to be the only one in the United States, is in its seventh year of successful operation in San Jose, Calif., the International City Managers' Association reports. The city took over the bureau in 1933, when the U. S. Weather Bureau decided to close its San Jose bureau because of a reduced appropriation. The City Council arranged for the Federal bureau to leave its equipment and records in San Jose to be operated and maintained by the city, which also retained the Government's meteorologist.

The station remains a cooperative unit in the far-flung network of the U. S. Weather Bureau. In return for furnishing instruments, books and supplies, the Government receives periodic reports and records from the San Jose station, which is the only bureau in the coastal section between San Francisco and Los Angeles that collects a complete 24-hour climatological record. The municipal station and the U. S. Weather Bureau cooperate also in issuing frost and storm warnings, so vital to the prune and apricot growers of the Santa Clara Valley, of which San Jose is the leading city. Finally, the San Jose bureau prepares daily weather charts on the basis of information broadcast by the Government's San Francisco office.

Probably most important to the city are the records the bureau maintains, the Association says. The data aided the city in securing the $10,000,000 aeronautical research laboratory of the National Advisory Committee for Aeronautics, and proved useful in advertising San Jose's climate. Other activities of the bureau include standard weather forecasting, local press releases, and observation of miscellaneous weather phenomena. Its bulletins are mailed to Federal agencies, engineering and construction firms, railroads, farmers, and food and industrial manufacturers. The demand for service from the San Jose bureau by governmental agencies and private interests has increased yearly.

The Census and Your City

WHAT can be done by the municipality which finds itself with a lessened population?

When the results of the 1940 census were announced, Schenectady found that its population had dwindled from the 1930 enumeration of 95,692 to 86,226, a loss of 9,466 residents. City officials, business men and the Chamber of Commerce realized immediately that the declining population meant more than the fact that city folks were just naturally drifting back to rural areas. Seeing how the decrease would reflect adversely upon the highly industrial community, they outlined a plan of action.

With the cooperation of the Chamber of Commerce, the Merchants Bureau, business, and the City Council, a committee of civic leaders was organized to make a survey of the census report. The Council, acting on a resolution presented by City Manager Charles A. Harrell, urged the Chamber of Commerce to investigate the matter. Mr. Harrell was empowered by the Council to consult with Chamber officials to determine the feasibility of working out a plan to cooperate with the Bureau of the Census so that, as far as possible, every inhabitant of the city would be counted. Mr. Harrell pointed out to the city officials that the investigation was not to be taken as a reflection upon the work which had been done by the Bureau of the Census, but simply as a means of assisting the Bureau so that the city would be certain the count showed the true situation.

With the city's cooperation, and enlisting the aid of newspapers and the local radio station, the Chamber of Commerce committee launched a drive to register all families who had been missed by the census takers. Valuable assistance was given by the district supervisor of the census, who offered helpful suggestions to the committee.

A coupon was published in two Schenectady newspapers requesting that heads of families not enumerated fill it out and return it to the Chamber of Commerce to be forwarded to the district census headquarters. On receipt of the coupon, census headquarters mailed a questionnaire to the family. The attention of the Federal Bureau of the Census was called to the Schenectady situation by the committee, and a representative was sent to discuss the matter with Chamber of Commerce officials.

The campaign was carried on about three weeks, with the result that 635 families, representing approximately 2,500 persons, were found to have been missed when the census was taken. While the 2,500 additional residents failed to make up for the loss in Schenectady's population, city officials and business men were gratified with the result of the campaign, which had been conducted at a minimum of expense to the city and the Chamber of Commerce.

Charles W. Stickle, Jr.

The Municipal Bond Market

Recent sales of new issues from August numbers of *The Bond Buyer:*

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$170,000	New Britain, Conn., Revenue Anticipation	.75	1-5 Ser.	.71
120,000	Gloucester, Mass., Relief	1	1-10 Ser.	.97
227,000	Allentown, Pa., School District, Refunding	1	5-5 Avg.	.99
163,000	Watertown, N. Y., Public Welfare	1.10	5-5 Avg.	1.03
100,000	Houston, Texas, General Improvement	1.25	1-10 Ser.	1.20
203,720	Columbus, Ohio, Delinquent Tax No. 4, Poor Relief	1.25	4.66 Avg.	1.21
150,000	Brockton, Mass., Municipal Relief	1.5	1-10 Ser.	1.34
223,500	Columbus, Ohio, Deficiency	1.5	6.16 Avg.	1.34
286,000	Plattsburgh, N. Y., Electric Power Plant	1.5	8.85 Avg.	1.48
250,000	Indianapolis, Ind., Public Works of 1940	1.75	11.85 Avg.	1.57
100,000	Phoenix, Ariz., Water Works Extension	3.75	14.33 Avg.	2.86
485,000	Jersey City, N. J., Hospital Building	3.75	12.66 Avg.	3.66
100,000	Haddon Tp., N. J., Sewer	4	1-25 Ser.	3.99

"Century" PIPE IN PORT HURON TOWNSHIP, EASILY LAID IN GRAVEL, QUICKSAND AND SWAMP

THE Township of Port Huron, Mich., Strawberry Lane Project, recently laid a line of "Century" Asbestos-Cement Pipe under unusually difficult soil and working conditions. As the illustrations show, much of the ground is swampy—yet no trouble was experienced in handling and coupling the lengths of "Century" Pipe.

"Century" Asbestos-Cement Pipe is light but strong. Easy to handle and lay, but lastingly maintenance-free. It is proof against corrosion and tuberculation. Its "Century" Flexible Couplings are applied quickly and simply. They remain permanently leak-proof.

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1 Lengths of "Century" Asbestos-Cement Pipe can be coupled in the bottom of a water-filled trench such as this at Port Huron, Mich. They report—"Usual difficulties were eliminated through using your 'Century' flexible couplings."

2 Pipe laying under difficulties at Port Huron Township. When such bracing is necessary, there is no chance to couple the pipe lengths on the top of the trench. The light weight of "Century" Pipe makes it easily handled even in places like this.

3 Lengths of "Century" Pipe may often be coupled on top of the trench, and easily lowered because of the pipe's light weight. "Century" Flexible Couplings are easily and quickly applied. They stay tight and leak-proof.

4 Above is a line being blown out before testing. Mr. A. Lee Snover, Clerk of the Township of Port Huron, says—"'Century' Pipe and Couplings were easily installed under the most difficult soil conditions. The line showed no leaks even during the first test. This township recommends it."

KEASBEY & MATTISON

COMPANY, AMBLER, PENNSYLVANIA

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

Zoning and Planning Notes

With the cooperation of
EDWARD M. BASSETT
Author of "Zoning" and of "The Master Plan"

Land Subdivision

CALIFORNIA. — *Application of Sidebotham.**—Planners have been interested in knowing whether a subdivision act describing a subdivision as a piece of property divided into five or more lots is legal. The Supreme Court of California in a case arising in Solano County (*In the Matter of the Application of Robert R. Sidebotham for a Writ of Habeas Corpus*) said in part: "Petitioner contends that section 20j, defining 'subdivision,' is arbitrary and indefinite, and also attacks the act for failure to define 'misrepresentation' or 'fraud.' We find no uncertainty in these terms. The Legislature must necessarily choose some point at which the sale of parcels from a large tract gives rise to the possible evils which require regulation, and we cannot say that the determination of five lots is improper."

Petitioner also claimed that the subdivision statute was not valid police power legislation because it benefits only a special class, the purchasers and lessees of subdivided real estate, and not the whole public. The Court held this claim to be without substance. It went on to say: "The police power may be and usually is exercised for the purpose of protecting particular classes of the public in need of such protection, and it is rare indeed that a single law includes everyone in the scope of its regulation."

Zoning—Residential District—Minimum Area Requirements

MICHIGAN.—*Most v. Township of Southfield,** Circuit Court of Oakland County, unreported.—The case was in the nature of a declaratory action to have a township zoning ordinance declared unconstitutional. It therefore was treated, like the Euclid Village case, as an action attacking the validity of the whole ordinance, as distinguished from an action in which a particular provision in a particular zone as it affects a particular lot is made the issue.

The plaintiff owned a subdivided tract of land 80 acres in extent. In the district in which the tract was located, the ordinance provided that no dwelling should be erected with less than 525 square feet of floor area per family at the first floor level or which provides less than 10,000 cubic feet of content.

The Court upheld the ordinance and laid stress upon the presumption of validity and also that the ordinance must be considered as a whole in its general scope and dominant features. The Court also stressed that plaintiff produced no proof showing that the ordinance did not involve a reasonable relationship to the welfare, peace and public health of the community, and stated that the size of a building may be conducive to public health and welfare. The Court also expressly held that undeveloped territory may validly be subjected to zoning regulation.

*From American Society of Planning Officials *News Letter*.

Zoning Ordinance—Res Adjudicata

NEW JERSEY.—*Phillips v. Township Council of Teaneck Township*, 13 Atl. 2d, 301 (Supreme Court, May 21, 1940).—This is a writ of certiorari in which the prosecutors attack an ordinance of the township of Teaneck, claiming that in so far as it affects their property it is unreasonable, capricious and arbitrary. The facts are outlined in an opinion of the Supreme Court which set aside a previous ordinance of like import. Both ordinances were amendments to the zoning ordinance, the prior one dealing only with a district in which prosecutors' property is located and the one now under review making the same change in that locality as well as other changes in other parts of the township. The change affecting prosecutors is the attempt to put their property in a class "C" residence zone, whereas it had previously been in a business zone.

There has been no change in the physical situation respecting prosecutors' property since the determination of the earlier case.

In this situation the Court is of opinion that the prior determination is controlling in this case and that the litigation is res adjudicata on the question of the reasonableness of zoning prosecutors' property for residence purposes in the existing factual situation. The questions here presented have therefore been determined adversely to the defendant township, and this ordinance, like the last one, is set aside in so far as it affects the property of the prosecutors.

Racial Zoning

NORTH CAROLINA.—*Clinard v. City of Winston-Salem*, 9 S. E. 2d, 867 (Supreme Court, February 2, 1940).—A general zoning ordinance containing reciprocal inhibitions of occupancy of residential districts by members of the white and Negro races, fairly apportioned, is invalid, as racial zoning. The law will not permit the indirect accomplishment of that which it directly forbids.

Streets

TENNESSEE.—*Dooley v. City of Cleveland*, 135 S. W. 2d, 649 (Supreme Court, January 20, 1940).—Generally a municipality may prohibit the sale on its streets of foodstuffs, meats, and other articles of merchandise in the interest of public health, to relieve congestion and public safety. One is not entitled to use highways for gain as a matter of common right.

An ordinance regulating the use of streets, applicable to a designated portion of a city only, is not discriminatory and invalid if the exclusion is reasonably required. Therefore an ordinance prohibiting the use of any portion of city streets for a market place for keeping for sale and selling any fruits, vegetables, ice cream or other refreshments, or any merchandise or other property in a certain area designated as congested, was not invalid as making a discrimination without reasonable basis; and the finding of the municipal authorities that the area was congested is entitled to great weight in this connection.

Commercial Zoning District—Filling Station—Variance—Appeal—Review of Determination of Planning Commission and Town Board

NEW YORK.—*Olp v. Town of Brighton*, 19 N. Y. S. 2d, 546 (Supreme Court, April 30, 1940).—This is an application of Albert C. Olp, trustee of the Finger Lakes Land Co. Inc., against the town of Brighton and others, denying Olp a permit for the operation of a filling station on his lot, in a commercial zoning district in the town. From the denial of the Planning Board to issue the permit, Olp appealed to the Town Board, which affirmed the decision of the Planning Board. Thereupon Olp brought that decision for review to this court.

Under the town ordinance a filling station may be allowed in a commercial district on application to the Planning Board. The determination of the Planning Board may be reviewed by the Town Board in the first instance without appeal to the Planning Board, sitting as a Board of Appeals.

In upholding the determination of the Planning Board and the Town Board, both of whom denied Olp's application, the Court says in part:

"At the threshold we are confronted with the contention of the petitioner that the word "may" in Section 16 must be construed as "must," and that in the face

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of this mandate the Planning Board had no discretion to withhold a permit from the petitioner after he had complied with all the conditions prescribed by the ordinance for the granting of a permit. To support his contention, the petitioner summoned the rule that when the act to be performed affects the interests of the public and the rights of third persons, permissive words in a statute conferring power on public officers will be construed as mandatory. But this is only a statutory rule of construction, useful to a limited degree but never to be followed slavishly where blind obedience would do violence to the manifest intention of the statute.

"To construe 'may' as 'must' in Section 16 would be not only to distort the ordinary meaning of the word but also to nullify the careful plan for community growth and specific provisions embodied in the zoning ordinance. The operation of a gasoline station is not proscribed in terms in a commercial district by Section 33 of the ordinance but the section, considered in the context of the provisions relating to all districts, says in all but words that the maintenance of a gasoline service station is a special privilege which requires the intervention and approval of the Planning Board before it can be indulged. If the issuance of a permit were mandatory, the provisions for a review of the determination of the Planning Board (Section 16) and for written notice to all occupants or owners of land within 500 feet of the area sought for special use (Section 52) would be meaningless. A zoning ordinance cannot be so easily reduced to impotence or futility.

"The pivotal issue in this proceeding is whether the Town Board as the legislative body of the town has conferred power on the Planning Board to grant or deny a permit for a gasoline station on the ground that the public health, safety, morals or general welfare will be promoted or obstructed, and whether, if such power has been conferred, it is an improper delegation of legislative authority.

"The ordinance does not expressly command the Planning Board to confine itself to a consideration of the health, safety, morals or the general welfare of the community, but such a command pervades the whole ordinance. Section 16, dealing with applications for permits for motor-vehicle supply stations, is silent on the policy which the Planning Board must respect in passing on these applications, but this silence has no judicial significance where voices elsewhere in the ordinance have declared the policy in unmistakable terms. Section 2 of the ordinance defines its scope and repeats verbatim the broad objectives of the enabling act (Town Law, § 261) which is the source of the authority of the town to enact a zoning ordinance. These objectives and concepts are admittedly and conveniently vague and constantly shifting in content and in meaning, but they are the controlling general principles to which administrative officials and agencies entrusted with the practical administration of the ordinance must bow. By them every use of property sanctioned by the ordinance must be weighed, and by them every act of an administrative board must be judged. No act of the administrative agency that clashes with the general purpose of the ordinance can survive.

"The power conferred on the Planning Board and on the appellate body of review is not an undefined general power which cannot lawfully be conferred on an administrative body. If a legislative body vests an administrative agency with power to exercise discretion, it must mark out the limits of that discretion by the formulation of some standard to guide the board or agency. All that these cases require is that some standard shall be established. It need not be specific. A standard may be general and none the less valid if it is capable of a reasonable application.

"The right of the law-making branch of government to delegate to some other agency the power to determine facts and conditions on which the operation or suspension of a statute depends has long been upheld. The statement of Judge Ranney [in *People ex rel. Doscher v. Sissun*], 222 N. Y., through clarity, accuracy, and frequent citation, has become classic: 'The true distinction * * * is between the delegation of the power to make the law, which necessarily involves a discretion as to what it shall be, and conferring an authority or discretion as to its execution, to be exercised under and in pursuance of the law. The first cannot be done; to the latter no valid objection can be made.'

"The discretion of the Planning Board was not untrammeled under this ordinance. It was to be exercised in the promotion of the public health, safety, morals or general welfare and in obedience to the rule of reason. Ample safeguards for its application were provided by ordinance and by statute in the form of a review of the decision of the Planning Board. A public hearing on any appeal from such a decision and a review by a court of record under Section 267 of the Town Law would catch any vagary and confine a vagrant discretion to its proper channels.

"A general standard in the application of the provisions of the zoning ordinance is sanctioned by more than persuasive analogies. Section 261 of the Town Law expressly provides that a board of appeals may determine and vary the application of the regulations of an ordinance 'in harmony with their general purpose and intent, and *in accordance with general or specific rules* therein contained.' (Italics mine.) * * *

"The petitioner cannot in any event urge the absence of any formulated standards as fatal to the decision denying him a permit, for the final approval or disapproval of the application lay in the hands of the Town Board. The ordinance, in prescribing a method of review of the decision of the Planning Board, gave to an aggrieved party the choice of appealing to the Planning Board sitting as a board of appeals, of appealing to the Town Board from a determination of the Planning Board, or of seeking a review by the Town Board in the first instance without appeal to the Planning Board. No appeal was taken to the Planning Board, but the petitioner chose a review by the Town Board. Under these circumstances, the power of the Town Board to approve or disapprove the proposed use of the petitioner's property was plenary and no standard was required for the exercise of its discretion. *Green Point Savings Bank v. Board of Zoning Appeals of the Town of Hempstead*, 281 N. Y. 534 [digested in our *Notes* for March, 1940].

"Whether the Town Board sat as a board of appeals or merely as the Town Board in its review of the denial of the petitioner's application by the Planning Board has no decisive significance. The vital fact remains that the Town Board was the legislative body of the town government whose power over the regulation of the use of property in the town was unconfined and plenary. It could not shed its legislative for an administrative capacity and subject itself to a restraint which it did not acknowledge or recognize as a legislative body. There can be no restraint in a legal sense when the power to act without it is undisputed. Indeed, the provisions of the ordinance conferring the right of review on the Town Board may have been intended to obviate the very objections concerning the absence of a definite standard which the petitioner is now advancing.

"The decisions of the Planning Board and of the Town Board are beyond the reach of successful challenge as arbitrary. The courts will not intrude upon the area of action marked out for an administrative body unless its decision was arbitrary or had no substantial relation to the public safety or the general welfare.

"Whatever doubt the Court may entertain as to the wisdom or correctness of the decisions of the Planning and Town Boards, I cannot say that they were arbitrary or unreasonable. . . ."

Editor's Note

With regard to the holding in this case that a local legislative body could not under New York laws act as an administrative authority, subject to the restraints usual in such cases, the reader is referred to case of *Brandon v. Board of Commissioners of Town of Montclair*, digested in our Notes for May, 1940, holding that in New Jersey this can be done.

FHA Studies Defense Housing and Neighborhood Rehabilitation

Two important additions to the staff of the Federal Housing Administration will enable that agency to cope more adequately with problems relating to defense housing and neighborhood rehabilitation.

Asssistant Administrator E. S. Draper, who came to FHA from TVA on June 24, in addition to assuming charge of Research and Analytical Studies, was given the added responsibility last month of heading up FHA's participation in the Defense Housing program.

Appointment of Henry V. Hubbard as planning advisor on Mr. Draper's staff brings a distinguished member of the planning profession into the councils of FHA. Professor Hubbard's principal work will be the making of careful evaluation of current activities of public and semi-public agencies in the field of neighborhood rehabilitation in the larger cities.

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Prepared by National Institute of Municipal Law Officers, Washington, D. C.

John A. McIntire and Charles S. Rhyne, Legal Counsel

Traffic Lights—Liability of City for Injuries Caused by Their Failure to Function

Cases are continuously arising against cities from alleged failure of traffic lights to function properly at street intersections. The usual claim is that the party suing the city approached a street intersection and, relying upon the fact that the red light was not on, entered the intersection without slowing down and collided with another party who entered the intersection under the same circumstances. The claim usually ignores the fact that no green light was in evidence and bases the claim entirely upon absence of the red light. Aside from the question of contributory negligence which it is submitted would bar such claims in almost every case, the reported decisions to date unanimously hold that maintenance of a traffic light at street intersections is a governmental function of cities and the city is therefore not liable for injuries caused by the failure of such traffic lights to function.

The leading case is *Auslander* v. *City of St. Louis*, 332 Mo. 145, 56 S. W. (2d) 778 (1932), where it was held that the city was not liable when an automatic stop-and-go sign showed "Go" for both directions and two automobiles collided as a result of the defective mechanism. There the Court said (p. 780):

"While we find no case in this state exactly in point, we are constrained to hold that the maintenance and operation by the city of automatic stop-and-go signals at street intersections for the purpose of regulating traffic and tending to promote safety is an exercise by the city of its governmental power, and for negligence in this respect the city cannot be held liable in damages."

Again at page 782, the Court said:

". . . Maintenance of a street in a safe condition for travel is a corporate duty . . . but . . . regulating the use of streets brings into exercise governmental and not corporate powers, and . . . there is no liability."

The cases of *Vickers* v. *City of Camden*, 3 Atl. (2d) 613 (1938, N. J.); *Dorminey* v. *City of Montgomery*, 232 Ala. 47, 166 So. 689 (1936); and *Parsons* v. *City of New York*, 289 N. Y. S. 198 (Sup. Ct. App. Div. 2d Dept. 1936), affirmed, no opinion, 273 N. Y. 547, 7 N. E. (2d) 685 (March, 1937), are exactly in point on the facts and follow the *Auslander* decision.

See also: *Cleveland* v. *Town of Lancaster*, 267 N. Y. S. 673 (1933) and *City of Rome* v. *Potts*, 45 Ga. App. 406, 165 S. E. 131.

Annexation

The rule that only the State Attorney General may question the validity of annexation of territory to a city applies only to an attempt to impeach a record which shows on its face a valid proceedings, and any interested taxpayer may sue to prevent completion of annexation of territory on the ground of lack of jurisdiction. *Colquhown* v. *City of Tucson*, 103 P. (2d) 269 (Ariz., June 10, 1940).

Billboards

Where it is claimed that ordinance prohibiting erection of billboards exceeding 5 feet in height or 8 feet in length within 300 feet of a public way is unreasonable, the burden is on those attacking the ordinance to show it to be capricious and arbitrary. The ordinance was held to be reasonable. *Town of Milton* v. *Donnelly*, 28 N. E. (2d) 438 (Mass., July 3, 1940).

Bonds

Owner of sanitary sewer district bonds of city could recover damages caused by failure of City Treasurer to pay bonds in their numerical order as required by statute. *Wangild* v. *Town of Haxton*, 103 P. (2d) 474 (Colo., May 6, 1940).

Civil Service

A special policeman irregularly employed by a city is not entitled to statutory protection against discharge conferred on regular policemen who have passed civil service examinations. *Seviers* v. *City of Middlesboro*, 140 S. W. (2d) 817 (Ct. App. Ky., May 17, 1940).

Civil Service

The required statement of reasons for discharge of a civil service employee under charter of city of Tacoma need not give a reason sufficient to sustain a criminal action, and any statement sufficient to enable the employee to prepare his defense is sufficient. *State ex rel. Ashing* v. *Davis*, 104 P. (2d) 335 (Wash., July 6, 1940).

Competitive Bidding

Fact that specifications for municipal sewage plant required bidders to submit two bids, one with and one without Works Progress Administration participation did not prevent competitive bidding. *Best* v. *City of Omaha*, 293 N. W. 116 (Nebr., June 22, 1940).

Employees—Marriage

Provision in city charter that where one spouse is employed by a city the other spouse shall not be employed, violates the constitutional mandate that neither privilege nor immunity shall be granted or withheld from any citizen or class upon terms different from those upon which they are granted or withheld from others. *Mansur* v. *City of Sacramento*, 103 P. (2d) 221 (Cal. App., June 5, 1940).

Engineering Fee

Civil engineer who prepared plans and estimates for town sewage system to support Federal Works Progress Administration application and who was not retained to supervise the actual construction work, was not entitled to the customary fee of 3½ per centum of the cost of the project but was entitled to $1,800, the actual cost and expense of the work done by him. *Blakewood* v. *Town of Franklinton*, 196 So. 909 (La., May 27, 1940).

Fireworks

Ordinance of city of Dallas prohibiting the sale or offering for sale of fireworks is a valid exercise of the city's police power. *Ex parte Clark*, 140 S. W. (2d) 854 (Tex. Crim. App., May 29, 1940).

License

City could levy a local license tax on one who held a beer-distributing license from the state and whose place of business was located in another city. *Webb* v. *City of Eminence*, 140 S. W. (2d) 622 (Ky., May 7, 1940).

Nuisance

Maintenance of coal pile and mechanical appliances for handling and distributing coal so as to give rise to a nuisance by causing dissemination of coal dust so as to damage and lower value of adjoining property, rendered city liable for damage so caused. *Walling* v. *City of Fremont*, 293 N. W. 226 (Nebr., July 5, 1940).

Parking Meters

There is no substantial relation between a meter charge for parking space on city streets and the over-parking evil so as to give the city authority to install parking meters under city's authority to regulate traffic—also the meter charge is a revenue measure which the city lacks authority to enact. *M. H. Rhodes, Inc.* v. *City of Raleigh*, 9 S. E. (2d) 389 (N. C., June 8, 1940). See "Parking Meters As City Legal Problems," Report No. 47 of National Institute of Municipal Law Officers, where the cases on this question are collected.

Pensions—Police

Under city of Bridgeport charter providing pensions for widows of policemen and defining widow as one married to deceased and "living with him" at the time of his death, the widow of a deceased policeman who was living apart from him at the time of his death was not entitled to a pension. *McPadden* v. *Morris*, 13 Atl. (2d) 679 (Conn., June 5, 1940).

Playgrounds

City should anticipate that iron rods sticking up three inches from center of cement post of partly demolished bench in public playground would be dangerous to children, and hence city was liable for injuries sustained when girl almost seven years old was injured on the iron rod. *Bonczek* v. *City of Philadelphia*, 10 Alt. (2d) 62 (Superior Ct. of Pa., 1939).

Public Utilities

City could operate municipal power plant in competition with a public utility now exercising a non-exclusive franchise within the city, even though such plant will finally destroy the value of the private utility plant. *Central Illinois Public Service Co.* v. *City of Bushnell, Illinois*, 109 F. (2d) 26 (Jan., 1940) (Circuit Ct. of App. Seventh Circuit).

Public Utilities

Charter of city giving the city permissive authority to control its streets with reference to their use by private utilities did not give city the power to grant a perpetual "franchise." *Continental Illinois Bank and Trust Co.* v. *City of Middlesboro, Ky.*, 109 F. (2d) 960 (C. C. A. 6th Circuit, 1940).

Removal of Officers

Removal of city physician by Mayor held proper in case where evidence was that city employees had no confidence in the physician, as removal order must be sustained unless there was an entire lack of evidence to sustain it. *Nider* v. *City Commission of City of Fresno*, 97 P. (2d) 293 (Dist. Ct. of App. Fourth District Calif., 1939).

Torts

City in constructing water cut-off box on playgrounds of school and allowing shallow water to remain about was exercising a governmental function delegated by the state with reference to the maintenance of public schools, and hence the city was not liable for injuries sustained by a school child who struck his knee against the cut-off box which was used by children as a first base in playing baseball. *Floyes* v. *City of Monroe*, 194 So. 102 (Ct. Appeals of La., March 4, 1940).

Torts—Flood Water

A city is liable for damages caused by surface flood waters which the city diverted by sewer over private property, and city's liability was not dependent upon whether the rainfall in question was unusual. *Nelson* v. *City of Sioux Falls*, 292 N. W. 868 (S. D., June 21, 1940).

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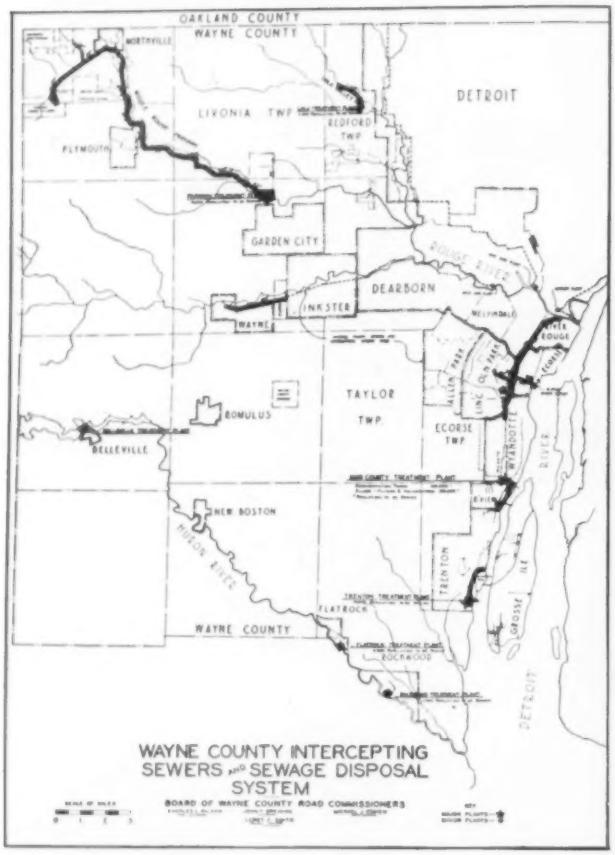

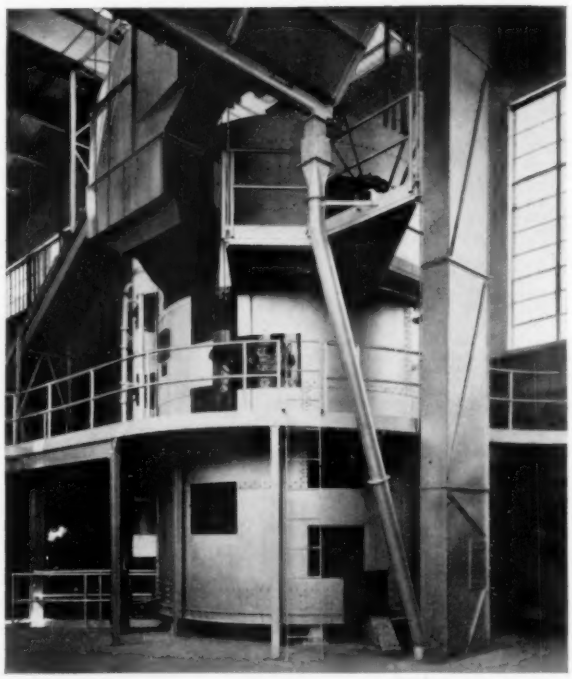

Right: View of 16'9" diameter, eight hearth Nichols Herreshoff Incinerator at Wyandotte

The entire Detroit and Wayne County area is now served by Nichols Herreshoff Incinerators at Wyandotte, Dearborn and Detroit.

The sewage from twenty-three municipalities in Wayne County, Michigan is treated in seven strategically located plants. Six of these are small plants without sludge disposal facilities. Stream-lined tank trucks carry liquid sludge and grit from these plants to the main plant at Wyandotte, where it is dewatered and burned to sterile ash in the eight hearth Nichols Herreshoff Incinerator.

Thus twenty-three localities are taking advantage of low cost centralized disposal of putrescible sewage sludge and grit in the most modern and scientific manner for the safeguarding of public health.

Any community interested in the sanitary disposal of municipal solid wastes — including sewage sludge, screenings, grit, garbage or rubbish should write "Incineration Headquarters" for the latest information and data. Bulletin No. 210 fully describes Nichols Herreshoff Incinerators.

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Municipal and Civic Publications

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Street Construction Costs

Road and Street Construction Methods and Costs.—By Halbert P. Gillette, Editor, Roads and Streets, and John C. Black, Associate Editor, Roads and Streets. Gillette Publishing Co., 330 S. Wells St., Chicago, Ill. 1940. 608 *pp.* $6.00 *from* THE AMERICAN CITY.

For making estimates to form the bases for bids on complicated construction, or for quickly weighing the general feasibility of a project, this book gives detailed data on costs, such as elaborate time studies of individual operations, and general average costs per unit of construction, such as the cost per mile for a given class of pavement. It is intended to point out the best methods and equipment for the most economic construction, and the best type of construction for the most economic service. The book presents hundreds of actual experiences, most of them summarized from articles in engineering and construction periodicals. Covered is the following comprehensive list of phases and types of construction: Cost Indexes; Overhead Costs; Engineering; Right-of-Way; Equipment; Labor; Clearing and Grubbing; Grading; Hauling and Handling Materials; Production of Aggregates; Untreated Bases and Surfaces; Bituminous Surfaces and Bases; Concrete Surfaces and Bases; Brick Pavements; Sidewalks, Curbs and Gutters; Walls, Fences and Guard Rails; Bridges and Culverts; Tunnel Construction; Grass, Trees and Shrubs.

Water Analysis

Chemical and Bacteriological Analyses of the Water in the Natural Waterways of the Interstate Sanitation District.—Federal Works Agency. Sponsored by Interstate Sanitation Commission, 60 Hudson St., New York. 1940. 312 *pp.*

Pollution has destroyed the use of New York Harbor and adjacent waters for recreational purposes; in some cases it has destroyed nearby property values. The Interstate Sanitation Commission was formed to abate the pollution of these waters upon which 85 municipalities border. This publication reports the process and results of their chemical and bacteriological analyses: General Description of Tests; Plan of Operation; Chemical Methods; Contingencies Affecting Operations; Tabular Summaries of Results; Discussion on Dissolved Oxygen Data.

Sewage Treatment

Sewage Treatment—By Karl Imhoff, Consulting Engineer, Essen, Germany, and Gordon M. Fair, Professor of Sanitary Engineering, Harvard Graduate School of Engineering, Cambridge, Mass., with a discussion of industrial wastes by Edward W. Moore, Assistant Professor of Sanitary Chemistry, Harvard Graduate School of Engineering, Cambridge, Mass. John Wiley & Sons, Inc., New York, 1940. 370 *pp.* $3.00 *from* THE AMERICAN CITY.

This new work, a successor to "The Arithmetic of Sewage Treatment Works" is novel in its omission of statistical information on design and operation, as it states that this information "is available in current journals of the profession and is omitted in order to conserve space. . . ." Higher mathematics and elaborate drawings have been replaced by simple arithmetical calculations and outline drawings. The volume covers the general consideration of sewage-treatment plants as regards location, efficiencies and methods as well as a general idea of costs. It then discusses the composition of sewage, methods of screening and skimming, sedimentation, chemical treatment, and biological treatment, filtration on natural soil and on coarse-grained beds, the activated sludge process, chlorination, and then the important subject of sewage sludge, its digestion and the utilization of sludge gas. The chapter on common industrial wastes should be helpful to many readers, as should be the chapters on self-purification of receiving waters.

Water Supply

Public Water Supplies.—By F. E. Turneaure, Dr. Eng., Emeritus Dean of the College of Engineering, University of Wisconsin, and H. L. Russell, Ph.D., Director of Alumni Research Foundation, University of Wisconsin; Chapters VIII, IX, X, on Quality of Water Supplies, by M. Starr Nichols, Ph.D., Professor Sanitary Chemistry, University of Wisconsin. John Wiley & Sons, Inc., New York. Fourth edition, revised, 1940. *xvi* + 704 *pp.* $6.00. From THE AMERICAN CITY.

The two main parts of this standard, comprehensive textbook deal with requirements and resources (quantity and quality of supplies) and the construction of water works. This fourth edition of the book, the first of which was published in 1901, has been revised throughout to conform to recent developments of engineering theory and practice in the field. Adding to the book's value as a reference volume are its detailed table of contents, and the bibliographies at the end of each chapter, which include not only books and pamphlets but extended lists of articles on the subjects involved.

Refuse Collection Costs

Factors Affecting the Cost of Refuse Collection.—American Public Works Association, 1313 E. 60th St., Chicago, Ill. 1940. 32 *pp.* 50c.

This is the preliminary edition of the fourth of the 15 proposed chapters of the work, "Refuse Collection Practice," now in preparation. Comparisons of costs in different cities are dangerous unless all factors and varying conditions are taken into account. This publication considers factors which in varying localities affect the cost of refuse collection: variations in service; disposal methods; variation in wage rates; climate; attitude of municipal officials; effects of the character of districts; character of population.

Mosquito Control

Mosquito Control—Practical Methods for Abatement of Disease Vectors and Pests.—By William B. Herms, Head of the Department of Entomology and Parasitology, College of Agriculture, University of California, and Harold F. Gray, Consulting Civil Engineer. The Commonwealth Fund, New York, 1940. *xii* + 317 *pp.* $3.50 *from* THE AMERICAN CITY.

The authors of this manual have been associated in mosquito control work on the West Coast for about 30 years and have produced a book which should be of value to those professionally connected with mosquito control as well as to the lay members of commissions and others interested in this phase of public health. The contents are divided into discussions of the economic importance of mosquitoes, the various laws and agencies for mosquito abatement, the preliminaries to abatement procedures; and then the education of the public, the locating of mosquito breeding places; and, finally, methods of abatement, including drainage, filling, pumping, flushing, oils and larvaecides, fish and supplementary protective measures.

Legal Symposium

Symposium on Municipal Tort Liability.—August, 1940, *issue of "Legal Notes on Local Government," Municipal Law Section, American Bar Association, 100 Washington Square E., New York.* 36 *pp.* $1.00.

This symposium, which considers reform of the law on municipal tort liability, is composed of: "Introduction," by Edwin Borchard; comment on, and listing of "Studies in Municipal Tort Liability," by Charles S. Ascher; "Recent Trends in Municipal Tort Liability," by Joseph F. Murray, Jr.; and an extended discussion of "Governmental Immunity from Liability for Tort in School Accidents," by Harry N. Rosenfield, which includes a critique of existing legal situations, considerations of policy, and recommendations.

Highways and Airport Runways

Asphaltic Mixtures in Bases—Heavy-Duty Streets, Roads, Airports.—By W. R. Macatee, District Engineer, Asphalt Institute, Washington, D. C. Apply to Simplicity System Co., Riverside Drive, Chattanooga, Tenn. 1940. 42 *pp. Free.*

This attractively illustrated bulletin points out trends in the construction and use of heavy-duty asphalt highways and airport runways, covering such factors as amount of traffic carried, thicknesses, costs, composition, curbs, bases. The asphalt mixtures that are used for different purposes by different states, and on different airports, are given in detail, with a collection of blueprints showing cross-section views of highways and runways, and layouts of runways and taxiways in different cities.

Standards for Concrete

Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete. —Joint Committee on Standard Specifications for Concrete and Reinforced Concrete. American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. 1940. 140 *pp.* $1.50.

The practices and specifications recommended in this report take account of advances which have been made, in the production of concrete and the design and construction of concrete structures, since the last report, in 1924, of the Joint Committee composed of representatives of six national organizations concerned. This report has been in preparation since 1930. It covers such subjects as materials; proportioning, mixing, curing, and testing concrete; forms and placing; details of design and construction.

Defense Housing

Danger to National Defense Program Because of Housing Shortage and Program for Immediate Action.—National Executive Committee of Housing Authorities, Washington, D. C. 1940. 24 *pp.*

Today in this country workers are being forced to leave jobs in defense industries because they cannot find places in which to live. Some families are paying 50 per cent of their income for rent; some workers are occupying beds in shifts; unfit houses are being inhabited. This report points out the acute need for defense housing and what must be done, the disastrous results of its lack in the World War when conditions were better than today; points out how to avoid these difficulties today, with specific recommendations for a positive housing defense program.

Housing Management

Administration of a Small Project.—By Abraham Goldfeld, Manager, Lavanburg Homes. Fred L. Lavanburg Foundation, 124-142 Goerck St., New York. 1940. 23 *pp.* 50c.

A handbook of operation for Lavanburg Homes, this manual presents in easy-reference, outline form, condensed information for the management of any small housing project. It covers the building, office, operating personnel and duties, routine service and equipment, accounting and auditing, permanent project records, community activities, and the library. All forms and schedules that have been developed in the project are reproduced.

Solicitations for Charities

Solicitations for Charitable Purposes.—Research Department, City of Houston, Texas. 1940. 14 *pp.*

Contained in this report is information on what is being done to control solicitations for charitable purposes in 30 cities of approximately the size of Houston (about 300,000). From this and from letters from officials in these cities recommendations are made for the revision of the Houston ordinance relating to this subject.

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City Finance Reports

The six following committee reports have been received from the Municipal Finance Officers Association, 1313 E. 60th St., Chicago, Ill. The first five were presented at the annual Conference of the Association at Detroit, Mich., June 19 of this year, and have been reprinted from the August issue of Municipal Finance.

Committee on Long-Term Financial Planning.—By George M. Link, Secretary, Board of Estimate and Taxation, Minneapolis, Minn. 7 *pp.* 5c.

Committee on Local Government Activities and Revenues.—By Charles J. Fox, City Auditor, Boston. 4 *pp.* 5c.

Committee on Accounting.—By Frank J. Flanagan, Budget Examiner, Chicago, Ill. 3 *pp.* 5c.

Committee on Special Assessments.—By John R. Lindsay, Director of Finance, Louisville, Ky. 6 *pp.* 5c.

Committee on Public Service Training.—By A. E. Fuller, Director of Finance, Miami, Fla. 4 *pp.* 5c.

Municipal Cost Accounting—A Preliminary Report of the Committee on Cost Accounting, Reprinted from Municipal Finance, May, 1940. —By Fred B. Wilson, Committee Chairman. 16 *pp.* 15c.

Assessment Organization

Assessment Supervision.—National Association of Assessing Officers, 1313 E. 60th St., Chicago, Ill. 1940. 46 *pp.* $1.00.

This is the seventh in the series of reports of the Committee on Assessment Organization and Personnel. It finds that the legal powers of assessment "supervision" are largely applied in practice as "advice" and "assistance." Municipal and county supervision are considered briefly, the more important state supervision occupying the large part of the report. Activities of the latter in 46 states are examined—educational, investigational, regulatory, enforcement and other miscellaneous activities and measures. The report concludes with 7 main recommendations.

Taxation Priority

Conflicting Tax Claims of the United States and of States or Local Subdivisions.—By Adrian N. Balstra. Reprinted from Legal Notes on Local Government, N. Y. University School of Law, Washington Square, New York. June, 1940. 7*pp.*

This article is concerned with the order of payment to Federal, state or local governments of conflicting tax claims, in cases where there are not sufficient funds to satisfy the respective governmental units. It considers the factors which affect priority: nature and effect of the tax obligation; and the financial condition of the delinquent taxpayer—solvent, insolvent, or bankrupt.

Redevelopment of Blighted Areas

The Menace of Urban Blight.—By Arthur C. Holden. Reprinted from the July, 1940, issue of The Appraisal Journal, 22 W. Monroe St., Chicago, Ill. Apply to the author, 670 Fifth Ave., New York. 8 *pp.*

What are the causes of blight? What attempts have been made to eliminate it? And what can be done to arrest and eradicate it? These are the questions that are taken up in this article, written particularly from the appraiser's point of view. It points out the injury of blight to both the city and the individual property owner, reviews briefly what is advocated by those who believe a cure consists in decentralization, in slum clearance, in modernization. The Urban Redevelopment Corporation Act, passed by the last New York Legislature but vetoed by the Governor, is analyzed for what it might do to root out blight from cities.

Fire Protection Systems

Detailed Specifications for Laying Fire Mains.—July, 1940, issue of Factory Mutual Bulletin of Loss Prevention, Associated Factory Mutual Fire Insurance Companies, 184 High St., Boston, Mass. 8 *pp.*

Yard piping which delivers the water used in fire fighting is required to withstand abnormal pressure and strain. Minimum standards are here given for private fire protective systems, for such pipes and their laying.

Cost of Traffic Delays

Effect of Traffic Delays on Gasoline Consumption.—By Alexander J. Bone, Assistant Professor of Highway Engineering, Massachusetts Institute of Technology. Reprinted from Proceedings of the Nineteenth Annual Meeting of the Highway Research Board, Dec., 1939. Apply to Department of Civil and Sanitary Engineering, Massachusetts Institute of Technology, Cambridge, Mass. 1940. 28 *pp.*

This article gives results of two experiments to show the effect of traffic delays on gasoline consumption and travel time. The first tested the difference of these two factors on streets in downtown Boston, when the test car was driven on congested weekdays, and when it was run on relatively traffic-free Sunday mornings. The second tested the difference in these two factors on two unobstructed parkways, and a congested highway running parallel to the parkways. Gasoline consumption and travel time greatly increased with traffic congestion. For example, in the first experiment, average gasoline consumption for the test car was 12.1 miles per gallon in city traffic, 18.2 without traffic interference.

Transit Accident Analysis

Collision-Accident Diagrams.—Prepared by Accident Research Staff, American Transit Association, 292 Madison Ave., New York. 1940. 38 *pp.* 50c.

Presented in this manual are suggested standard collision-accident diagrams for use in analyzing accidents and accident problems of street-car, motor-bus and trolley-coach operation in relation to other street traffic. Prepared as part of the Accident Research Program of the Association, it is an adaptation of traffic-engineering practices developed after trial application on transit properties. The purpose, principles and uses of the symbols and diagrams are clearly explained.

New York Housing

Citizens' Housing Council of New York—A Condensed Summary of the Third Year's Work. —Citizens' Housing Council of New York, 470 Fourth Ave., New York. 1940. 24 *pp.* 10c.

The Citizens' Housing Council was organized for the purpose of getting together to improve New York's housing and neighborhood conditions, persons interested in housing who have many different, often conflicting, points of view—leading representatives of public welfare and real estate groups, architects, public officials, tenant organizations, banks, legislative bodies, laymen, and other groups concerned with housing. This report of the activities and accomplishments of the Council's third year points out how such an organization can be of specific constructive value in furthering a housing program and bettering housing conditions in a city. Among the many and varied achievements described are influence on the city's housing by research and studies; stimulation of private investment housing, proposals of legislation which was adopted, coordination of different city agencies, public information and education through public meetings, forums, seminars and exhibits.

Modern Architecture

The Modern House in America.—By James Ford and Katherine Morrow Ford. Architectural Book Publishing Co., Inc., 112 W. 46th St., New York. 1940. 134 *pp.* $5.00 *from* THE AMERICAN CITY.

A quick picture is given in this book, not only of the techniques, but of the essential purposes and spirit of modern American residential architecture—a form which follows and has grown out of the needs and composition of the family, the requirements of site, and the possibilities of new materials and inventions. The book consists largely of illustrations of exteriors and interiors of houses which exemplify modern architecture, with accompanying floor plans and other diagrams. For each house, family composition and requirements, site construction, exterior, interior and cost are stated. Included is a brief historical and descriptive analysis of the modern house in America, and opinions by noted architects as to what they consider to be the distinctive contribution of America in this field.

The Forest Problem

Our Forests.—By David Cushman Coyle. National Home Library Foundation, Washington, D. C. 1940. xii + 154 *pp.* 25c.

This is the story of America's forests, told simply and dramatically—the story of why we have only 130 million acres of virgin forest where once we had 820, and how we lose 12 million dollars annually in unnecessary forest fires; the value of forests—for pulp and paper, for furniture, for farm woodlots, for watersheds which prevent soil erosion and floods, for grazing, for recreation, and many other every-day uses; the necessity for preserving what forests we have left, and for fighting the enemies of the trees—fires, insects, blight. The booklet tells of the work that is being done by Federal and local agencies to save and build up this national resource, and suggests further steps that need to be taken by every layman. (See p. 71 of this issue for excerpts on city forests, from this publication.)

Government and Economics

Government and Economic Life.—By Leverett S. Lyon and Victor Abramson. The Brookings Institution, Washington, D. C. Apply to the Maurice and Laura Falk Foundation, Farmers Bank Bldg., Pittsburgh, Pa. 1940. 66 *pp. Free.*

The whole broad relationship of government and the general economic life, and its implications—a wider subject than the mere control of business by government—is the subject of this pamphlet, which is an interpretative summary of the Institution's two-volume work, "Government and Economic Life." (See p. 115 of the January, 1940, issue of THE AMERICAN CITY, for review.) Four main types of government control are taken up: the implementation of private enterprise; the regulation of private enterprise, by protecting competition, and by creating a plane of competition; special treatment of particular industries, and of the general economic life on particular occasions; direct production by government.

Subdivision Planning

Successful Subdivisions—Principles of Planning for Economy and Protection against Neighborhood Blight (Land Planning Bulletin No. 1).—Federal Housing Administration, Washington, D. C. 1940. 29 *pp.*

Neighborhood blight can be retarded, if not eliminated, by planning. Moreover, planning lowers costs of land development. Why this is so is pointed out in this pamphlet, which concisely presents, with diagrams, principles of good neighborhood planning and development.

Other Reports Received

CHICAGO, ILL.—Recent Council-Manager Developments and Directory of Council-Manager Cities. International City Managers' Association, 1313 E. 60th St. 15 pp. 50c.

CRYSTAL FALLS, MICH.—Annual City Statement and Report on Audit, year ended March 31, 1940. 32 pp.

DETROIT, MICH.—Annual Report, City Planning Commission, 1939. 25 pp.

DUBUQUE, IOWA.—Annual Report, Water Department, year ended March 31, 1939. 79 pp.

EASTON, PA.—Annual Report, 1939. 48 pp.

KANSAS.—Assessment of Real Estate in Kansas. Research Department, Kansas Legislative Council, Topeka.

LEWISTON, IDAHO.—Annual Report, Engineering, Park, Cemetery, Water and Street Departments, year ended June 30, 1940. 55 pp.

MARYLAND.—Municipal Legislation in Maryland. Research Division, Maryland Legislative Council, Annapolis. 59 pp.

—"The Japanese Beetle in Maryland." By Ernest N. Cory and George S. Langford. Extension Service, University of Maryland, College Park, Md. 19 pp.

MILO, MAINE.—Annual Report, year ended February 1, 1940.

NORMAN, OKLA.—Yearbook, 1939-40. 46 pp.

PITTSFIELD, MAINE.—Annual Report, year ended February 20, 1940. 231 pp.

SACRAMENTO, CALIF.—Report of the City Manager on a Study of Advance Programming and Budgeting of Public Works. 69 pp.

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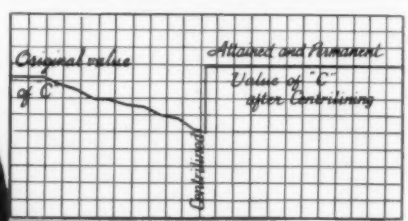

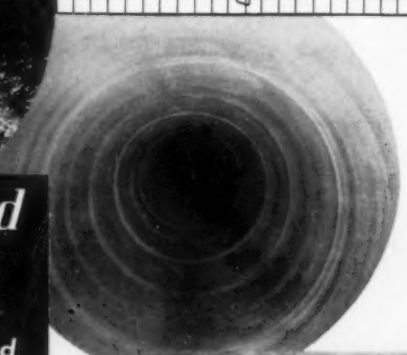

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Conventions - - When and Where

Meeting is annual convention unless otherwise designated

SEPTEMBER 15-19.—SEATTLE, WASH.
American Asssociation of State Highway Officials. Sec.-Treas., W. C. Markham, 1220 National Press Bldg., Washington, D. C.

SEPTEMBER 16-17.—DENVER, COLO.
American Water Works Association—Rocky Mountain Section. (Cosmopolitan Hotel.) Sec., B. V. Howe, State Office Bldg., Denver, Colorado.

SEPTEMBER 16-19.—SAN DIEGO, CALIF.
League of California Cities. Sec., Richard Graves, 2121 Allston Way, Berkeley, Calif.

SEPTEMBER 16-17.—GOODLAND, KANS.
Kansas Association of Municipal Utilities. Sec.-Treas., L. C. Angevine, McPherson, Kans.

SEPTEMBER 18-20.—NEW CASTLE, PA.
American Water Works Association—Western Pennsylvania Section. (Castleton Hotel.) Sec., E. P. Johnson, 418 Flannery Bldg., Pittsburgh, Pennsylvania.

SEPTEMBER 18-20.—LAKE PLACID, N. Y.
Municipal Electric Utilities Association of New York State. (Lake Placid Club.) Sec., T. J. McKee, P. O. Box, 686, Jamestown, N. Y.

SEPTEMBER 19-21.—NEW YORK CITY.
United States Conference of Mayors. (Waldorf-Astoria Hotel.) Exec. Dir., Paul V. Betters, 730 Jackson Place, N. W., Washington, D. C.

SEPTEMBER 22. Week of.—WHITE SULPHUR SPRINGS, W. VA.
American Transit Association. (The Greenbrier Hotel.) Gen. Sec., Guy C. Hecker, 292 Madison Ave., New York.

SEPTEMBER 22-24.—ROANOKE, VA.
League of Virginia Municipalities. (Hotel Roanoke.) Exec. Sec., Morton L. Wallerstein, 902 Travelers Bldg., Richmond, Va.

SEPTEMBER 23-26.—COLORADO SPRINGS, COLO.
International City Managers' Association. (Broadmoor Hotel.) Exec. Dir., Clarence E. Ridley, 1313 E. 60th St., Chicago, Ill.

SEPTEMBER 23. Week of.—FRANKFORT, KY.
Kentucky Municipal League. (New Capital Hotel.) Exec. Sec., Carl B. Wachs, Univ. of Kentucky, Lexington, Ky.

SEPTEMBER 23-25.—TOPEKA, KANS.
League of Kansas Municipalities. (City Auditorium.) Exec. Sec., John G. Stutz, Lawrence, Kans.

SEPTEMBER 24-27.—CLEVELAND, OHIO.
American Institute of Park Executives and the American Park Society. (Hotel Statler.) Exec. Sec., Will O. Doolittle, Box 422, Tulsa, Oklahoma.

SEPTEMBER 24-26.—PEORIA, ILL.
Illinois Association of Park Districts. (Père Marquette Hotel.) Exec. Dir., A. D. McLarty, 500 E. Capitol Ave., Springfield, Ill.

SEPTEMBER 24-27.—NEW YORK CITY.
New England Water Works Association. (Hotel Commodore.) Sec., Frank J. Gifford, 613 Statler Bldg., Boston, Mass.

SEPTEMBER 26-28.—WAHPETON, N. DAK.
North Dakota Water and Sewage Works Conference. (Wahpeton Hotel.) Sec.-Treas., L. K. Clark, Bureau of Sanitary Engineering, Bismarck, N. Dak.

SEPTEMBER 30-OCTOBER 2.—DETROIT, MICH.
American Public Works Association. (Book-Cadillac Hotel.) Asst. Dir., Norman Hebden, 1313 E. 60th St., Chicago, Ill.

SEPTEMBER 30-OCTOBER 4.—CLEVELAND, OHIO.
National Recreation Association. (Hotel Statler.) Sec., Howard S. Braucher, 315 Fourth Ave., New York.

OCTOBER 1-2.—COLUMBUS, OHIO.
Ohio Conference on Sewage Treatment. (Neil House.) Sec., B. M. McDill, Dept. of Health, Columbus, Ohio.

OCTOBER 2-4.—ROCK ISLAND, ILL.
Illinois Municipal League. (Fort Armstrong Hotel.) Exec. Dir., A. D. McLarty, 500 E. Capitol Ave., Springfield, Ill.

OCTOBER 3-5.—CHICAGO, ILL.
(Hotel Sherman.) First annual convention of the *Federation of Sewage Works Associations,* Sec.-Treas., H. E. Moses, 1522 N. Second St., Harrisburg, Pa., meeting in conjunction with the annual meeting of the *Central States Sewage Works Association,* Sec., W. H. Wisely, State Dept. of Public Health, Springfield, Ill.

*OCTOBER 4-5.—STOCKBRIDGE, MASS.
Massachusetts Federation of Planning Boards. Sec., Frank H. Malley, 240 Maple St., West Roxbury, Mass.

OCTOBER 5-8.—CHICAGO, ILL.
Institute of Traffic Engineers. (Sherman Hotel.) Sec.-Treas., Harold F. Hammond, 60 John St., New York.

OCTOBER 7-11.—CHICAGO, ILL.
National Safety Council. (Stevens Hotel.) M'ng Dir., W. H. Cameron, 20 N. Wacker Drive, Chicago, Ill.

OCTOBER 8-11.—DETROIT, MICH.
American Public Health Association. (Book-Cadillac Hotel.) Exec. Sec., Dr. Reginald M. Atwater, 50 W. 50th St., New York.

OCTOBER 8-9.—MADISON, WIS.
Wisconsin Chiefs of Police Association. (Hotel Loraine.) Sec., R. K. McCarty, Kaukauna, Wis.

OCTOBER 9-11.—JACKSON, MICH.
Michigan Municipal League. (Hotel Hayes.) Dir., Herbert A. Olson, 205 South State St., Ann Arbor, Mich.

OCTOBER 9-11.—MILWAUKEE, WIS.
League of Wisconsin Municipalities. Sec., Frederick MacMillin, 30 E. Johnson St., Madison, Wis.

OCTOBER 10-11.—GLEN FALLS, N. Y.
American Water Works Association—New York Section. Sec.-Treas., R. K. Blanchard, 50 W. 50th St., New York.

OCTOBER 13-15.—CHARLOTTE, N. C.
North Carolina League of Municipalities. (Hotel Charlotte.) Exec. Sec., Patrick Healy, Jr., 704 Raleigh Bldg., Raleigh, N. C.

OCTOBER 14-17.—TULSA, OKLA.
American Water Works Association—Southwest Section. (Mayo Hotel.) Address: Sec., Lewis A. Quigley, Supt. of Water Works, Fort Worth, Texas.

OCTOBER 14-16.—MANITOWOC, WIS.
American Water Works Association—Wisconsin Section. (Hotel Manitowoc.) Sec., L. A. Smith, City Hall, Madison, Wis.

OCTOBER 14-17.—JACKSONVILLE, FLA.
International Municipal Signal Association, Inc. (Roosevelt Hotel.) Sec., Irvin Shulsinger, 8 E. 41st St., New York.

OCTOBER 14-18.—DETROIT, MICH.
National Association of Public School Business Officials. (Book-Cadillac Hotel.) Sec., H. W. Cramblet, Board of Education, Pittsburgh, Pa.

OCTOBER 15-17.—SPRINGFIELD, MASS.
New England Sewage Works Association. (Hotel Kimball.) Sec.-Treas., LeRoy W. Van Kleeck, State Office Bldg., Hartford, Conn.

OCTOBER 16-18.—ATLANTIC CITY, N. J.
Pennsylvania Water Works Association. (Haddon Hall.) Sec., Dr. F. Herbert Snow, 327 Telegraph Bldg., Harrisburg, Pa.

*OCTOBER 17-18.—MITCHELL, S. DAK.
South Dakota Water and Sewage Works Conference. (Hotel Widmann.) Sec., W. W. Towne, State Board of Health, Pierre, S. Dak.

OCTOBER 18-19.—ATLANTIC CITY, N. J.
American Water Works Association—New Jersey Section. Fall meeting. (Madison Hotel.) Sec.-Treas., C. B. Tygert, Box 178, Newark, N. J.

OCTOBER 20-23.—BOSTON, MASS.
National Association of Commercial Organization Secretaries. (Copley-Plaza Hotel.) Asst. Sec.-Treas., Mrs. Norma McKellops, 1615 H St., N. W., Washington, D. C.

OCTOBER 21-23.—LEXINGTON, KY.
American Water Works Association—Kentucky-Tennessee Section. (Lafayette Hotel.) Sec.-Treas., Howard D. Schmidt, 420 6th Ave., N., Nashville, Tenn.

* First appearance of notice on this page.

OCTOBER 21.—BLUEFIELD, W. VA.
League of West Virginia Municipalities. Exec. Sec., Hume K. Nowlan, Hinton, W. Va.

OCTOBER 23-26.—LOS ANGELES, CALIF.
American Water Works Association—California Section. (Biltmore Hotel.) Sec., Burton S. Grant, Arcade Annex, Los Angeles.

OCTOBER 23-25.—SCOTTSBLUFF, NEBR.
League of Nebraska Municipalities. (Hotel Lincoln.) Sec.-Treas., C. E. Beals, 204 Brownell Bldg., Lincoln, Nebr.

OCTOBER 24-26.—HUNTINGTON, W. VA.
American Water Works Association—West Virginia Section. (Prichard Hotel.) Sec., John B. Harrington, State Dept. of Health, Charleston, W. Va.

*OCTOBER 24-25.—TORONTO, ONT.
The Canadian Institute on Sewage and Sanitation. (Royal York Hotel.) Sec.-Treas., A. E. Berry, Dept. of Health, Parliament Bldg., Toronto, Ont.

OCTOBER 28-30.—RALEIGH, N. C.
Joint meeting. (Hotel Sir Walter.) *American Water Works Association—North Carolina Section,* Sec., R. S. Phillips, 206 Dacian Ave., Durham, N. C. *North Carolina Sewage Works Association,* Acting Sec., A. R. Hollette, Chapel Hill, N. C.

NOVEMBER 7-8.—WILMINGTON, DEL.
American Water Works Association—Four States Section. (Hotel DuPont.) Sec.-Treas., Carl A. Hechmer, Washington Suburban Sanitary District, Hyattsville, Md.

NOVEMBER 7-8.—ST. PAUL, MINN.
American Water Works Association—Minnesota Section. (St. Paul Hotel.) Sec.-Treas., Ronald M. Finch., Wallace & Tiernan Co., Inc., 414 Flour Exchange, Minneapolis.

*NOVEMBER 7-9.—AMES, IOWA.
Iowa Sewage Treatment Conference. (Iowa State College.) Sec.-Treas., Lindon J. Murphy, Iowa State College, Ames, Iowa.

NOVEMBER 7-8.—FORT WORTH, TEXAS.
League of Texas Municipalities. (Texas Hotel.) Exec. Sec., E. E. McAdams, 2223 Guadalupe St., Austin, Texas.

*NOVEMBER 12-13.—PITTSBURGH, PA.
Engineers Society of Western Pennsylvania. (William Penn Hotel.) Chairman, H. M. Olson, 171 Longue Vue Drive, Mt. Lebanon, Pittsburgh, Pa.

*NOVEMBER 13-15.—CHICAGO, ILL.
The American Municipal Association. (Congress Hotel.) Exec. Dir., Earl D. Mallery, 1313 E. 60th St., Chicago, Ill.

NOVEMBER 13-15.—OMAHA, NEBR.
American Water Works Association—Missouri Valley Section. (Hotel Fontenelle.) Sec., Earle L. Waterman, Univ. of Iowa, Iowa City, Iowa.

NOVEMBER 14-15.—ATLANTIC CITY, N. J.
New Jersey State League of Municipalities. (Hotel Traymore.) Acting Sec., Mrs. Madeleine S. Frost, 808 Trenton Trust Bldg., Trenton, N. J.

*NOVEMBER 15-16.—ASBURY PARK, N. J.
New Jersey Health and Sanitary Association. (Berkeley-Carteret Hotel.) Sec., Dr. Edward Guion, Drawer D, Northfield, N. J.

*NOVEMBER 18-20.—SPRINGFIELD, MASS.
National Municipal League. (Hotel Kimball.) Sec., Howard P. Jones, 299 Broadway, New York.

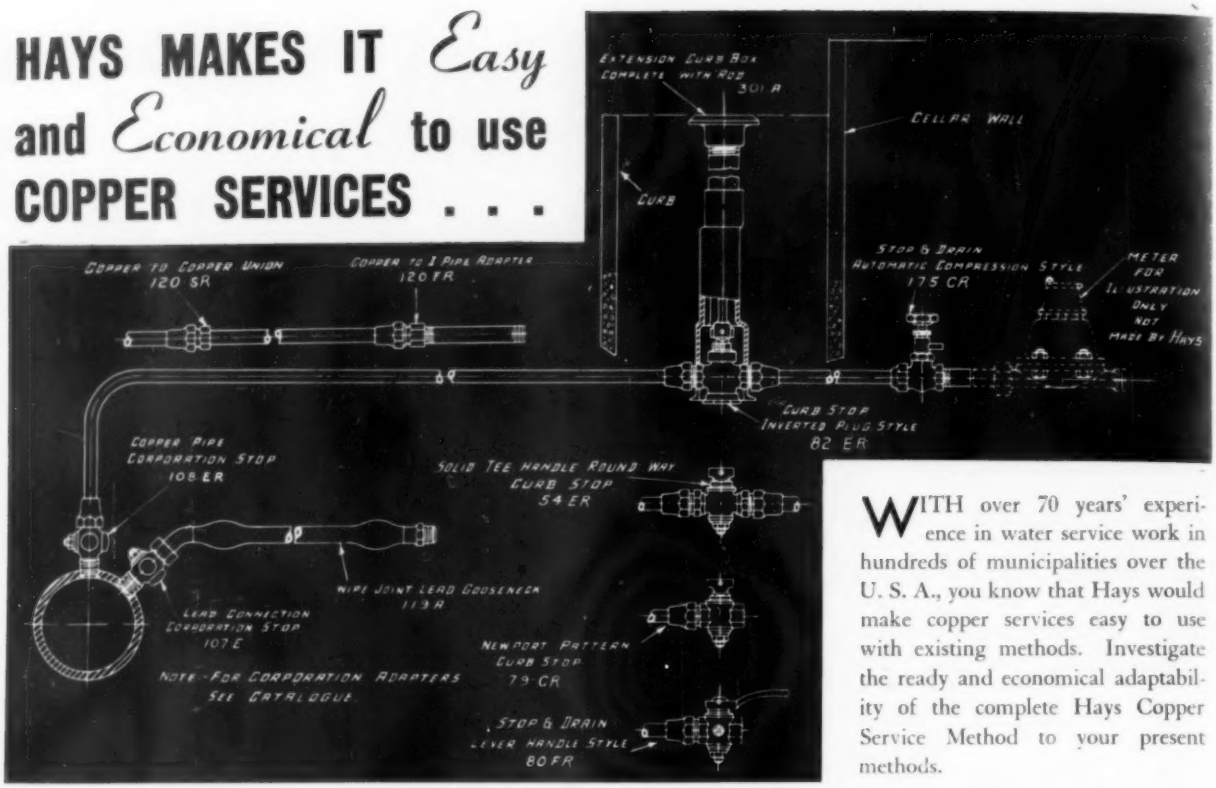
DECEMBER 2-5.—NEW YORK CITY.
American Society of Mechanical Engineers. (Hotel Astor.) Nat'l Sec., C. E. Davies, 29 W. 39th St., New York.

*DECEMBER 2-3.—CHICAGO, ILL.
Annual symposium. Tax Policy League. (Palmer House.) Exec. Sec., Miss Mabel L. Walker, 907 Broadway, New York.

DECEMBER 9. Week of.—DALLAS, TEXAS.
The Asphalt Institute. M'ng Dir., J. E. Pennybacker, 801 Second Ave., New York.

JANUARY 27-30, 1941.—NEW YORK CITY.
American Road Builders' Association. (Pennsylvania Hotel.) Engr.-Dir., Charles M. Upham, Nat'l Press Bldg., Washington.

HAYS MAKES IT *Easy* and *Economical* to use COPPER SERVICES . . .


EXTENSION CURB BOX COMPLETE WITH ROD 301 A
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COPPER TO COPPER UNION 120 SR
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METER FOR ILLUSTRATION ONLY NOT MADE BY HAYS
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STOP & DRAIN LEVER HANDLE STYLE 80 FR

WITH over 70 years' experience in water service work in hundreds of municipalities over the U. S. A., you know that Hays would make copper services easy to use with existing methods. Investigate the ready and economical adaptability of the complete Hays Copper Service Method to your present methods.

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WATER WORKS BRASS, COPPER AND LEAD PRODUCTS...SINCE 1869

MURDOCK

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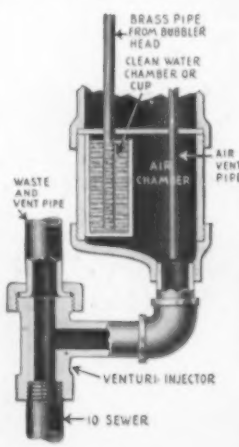
The Most Reliable Name on Water Service Devices

One avenue, still periling public health, so they said, bothered the Health Authorities of the nation. There remained in Outdoor Drinking Fountains a bare possibility of the contamination of the fresh water supply by pollution from a backed-up sewer . . . and so the H. A.'s came to Murdock . . . and Murdock responded to their challenge with the

Also Makers of the Original MURDOCK HYDRANTS. Standard Since 1853.



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ANTI-FREEZING OUTDOOR DRINKING FOUNTAIN

In our "Air Lock" Fountain we present to the city officials of the United States and Canada the most sanitary and practical outdoor drinking fountain obtainable.

This is a detail of the AIR LOCK. We utilize an Old, Well-Known Principle of Hydraulics to safeguard the fresh water supply against pollution from sewer without the use of a mechanical device.

It is the sturdiest fountain we have ever made. All inner working parts come completely and permanently assembled. A foolproof, trouble-proof outdoor fountain requiring minimum maintenance.

We urge you to write for "The Story of the Air Lock Fountain."

Patent Pending

THE MURDOCK MFG. & SUPPLY CO.

426 PLUM ST. : : : CINCINNATI, OHIO

During September we hope you will remember to mention THE AMERICAN CITY.

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

The Late George B. Gascoigne

George Gascoigne, Well-Known Consulting Engineer, Dies

George B. Gascoigne, nationally known consulting sanitary engineer and head of George B. Gascoigne & Associates in Cleveland, Ohio, died on August 17 at the age of 56, after an illness of several months.

Born in Oak Harbor, Ohio, Mr. Gascoigne was graduated in civil engineering from Ohio State University in 1910. In 1912 he went to work for the city of Cleveland in the subdivision of sewage disposal. During his ten years of city employment, Mr. Gascoigne was either in immediate charge or had general supervision of this subdivision.

In 1922 Gascoigne & Associates was formed, with headquarters in the Leader Building, Cleveland, and an office in New York City. Since that time, Mr. Gascoigne's private practice has included the design and supervision of construction of a large number of sewerage and water-supply systems, one of his outstanding projects being Cleveland's three new sewage-disposal plants. Other large projects designed by Mr. Gascoigne are the sewerage systems of Alliance, Ashtabula, Elyria, Marion, Massillon, Cincinnati and Springfield, Ohio; Anderson, Fort Wayne and Muncie, Ind.; Buffalo and Elmira, N. Y.; Chattanooga, Tenn.; Jackson, Mich.; New Haven, Conn.; Springfield, Mass., and Omaha, Nebr.; water-supply projects for Alliance, Elyria, Marion, Springfield, Avon Lake, Bellevue and Painesville, Ohio; and Anderson and Fort Wayne, Ind.; and incinerating plants for Easton, Md.; Newport, R. I.; and Peekskill and New Rochelle, N. Y.

Mr. Gascoigne furnished technical information before the U. S. Supreme Court in the Lake Michigan water-diversion case of the states of *Wisconsin, Minnesota, Ohio and Pennsylvania vs. the Chicago Sanitary District* and before the Federal Circuit Court in the case of *Activated Sludge, Inc. vs. the Milwaukee Sewerage Commission*. He has also furnished expert testimony and technical aid to attorneys in litigation on pollution and other sanitary and hydraulic problems.

Mr. Gascoigne was a registered professional engineer in New York, Ohio and Indiana and a member of the American Society of Civil Engineers, American Institute of Consulting Engineers, American Water Works Association, American Public Works Association, and American Public Health Association.

The death of Mr. Gascoigne is a severe loss not only to his friends and associates but to the entire sanitary engineering fraternity and the field of public health.

Button Reflectors on Penn. Turnpike

A contract was recently awarded to Western Cataphote Corporation, of Toledo, Ohio, for furnishing and installing various types of reflector units in the center strip and along the shoulders of the new 160-mile Pennsylvania Turnpike between Harrisburg and Pittsburgh. This direct contract for approximately $66,000 includes NiteWay Outliners for the center strip. These are two-way reflector units visible to traffic at night coming from either direction. In addition, similar one-way Outliners are being furnished for the two outside shoulders for placing 10 feet from the edge of the pavement. Additional non-reflecting center mushrooms are included in the contract for dividing traffic in the tunnels. In addition, there are 2,400 structure markers to be placed at the end of guard-rail installations, culverts and bridges.

All the reflectors are standard Cataphote reflector buttons, 7/8-inch diameter, arranged six to each single Outliner and twelve for double markers. The installation of the NiteWay Outliners was subcontracted to Ray McCarty of Kaukauna, Wis., who is working out of Bedford, Pa. The installation began August 1, 1940, and will be completed by October 1.

Water-Lubricated Well-Pump Bearings

By means of a heavy application of electrolytically deposited chromium over a stainless sleeve of monel metal which has been swedged into a vertical pump shaft, a new type of water-lubricated bearing has been produced by Peerless Pump Co., 301 West Avenue 26, Los Angeles, Calif. This patented process has been developed for use in deep-well vertical pumps. The pump shaft is armored with heavy chromium over a non-corrosive metal sleeve every 10 feet. These sections of the shaft operate within resilient cutless rubber journals, which are fluted and non-revolvable. Any sand in the water flushes through the bearing. Because of the extreme hardness and thickness of the chrome and its bearing contact with cutless rubber, no abrasion occurs, according to the reports of Peerless engineers.

A bulletin describing this new chromium-armored bearing may be obtained by writing to Peerless Pump Co.

New England Water Works Association Convention
New York City
September 24-27, 1940

A breakfast at the Havana Yacht Club celebrated the inauguration of the new Cuban Section of the American Water Works Association. Among the guests were (left to right) Colonel W. F. Rockwell, President, Water Works Manufacturers Association, and President of the Pittsburgh Equitable Meter Co., who has been active in the formation of the Cuban Section; Dr. Domingo Ramos, the Cuban Secretary of Defense; Edwardo J. Chibas, newly elected President of the Cuban Section; Norman J. Howard, President of the A. W. W. A.; Francisco Gaston, President of the Cuba Society of Engineers

This Burroughs dispatch system for speeding service calls in a metropolitan area has its counterpart in Burroughs offices everywhere.

THEY GUARD YOUR OFFICE against interruption

Burroughs maintains more than 430 service centers. Uniformly efficient local service—readily available to every Burroughs user—extends to every county in the United States, to every part of Canada, and to foreign countries.

Burroughs prompt, efficient local service is recognized by users as being without an equal for safeguarding the mechanical performance of office machines. Each man in Burroughs vast service organization is factory-trained, factory-controlled, and paid solely by Burroughs. Each is placed where he is readily available to render periodic or emergency service to Burroughs users in his territory, and his work is supervised and guaranteed by Burroughs. Such efficient service saves time and money, assures minimum interruption in office routine, and is a major reason why over a million businesses have decided in favor of Burroughs equipment.

BURROUGHS ADDING MACHINE COMPANY, DETROIT, MICHIGAN

Today's **Burroughs**

DOES THE WORK IN LESS TIME—WITH LESS EFFORT—AT LESS COST

Fred W. Hartmann

New Director for National Meter Co.

Fred W. Hartmann, Manager of the Chicago Branch of the National Meter Co., Brooklyn, N. Y., was elected a director of the company at its annual meeting July 30, 1940. Mr. Hartmann graduated from the University of Michigan after having served with the Marines in France during the World War. He served as City Engineer and Water Superintendent at Iron Mountain, Mich., and as City Manager at Alma, Mich., before joining the National Meter Co. in 1928. Mr. Hartmann is also a trustee of the Illinois Section of the American Water Works Association.

Refuse Body Compacts Load of Bulk Rubbish

The Kompaka refuse-collection body, shown in the accompanying illustration mounted on a Mack truck, is provided with loading openings on both sides in the front of the body large enough to load barrels, large cartons, boxes, mattresses, and other bulky material. A large packing plate with the same internal dimension as the body is pushed forward by hydraulic power, compressing and packing the refuse solidly in the rear of the body.

A pre-set pressure valve and automatic stops control the movement of this packing plate both forward and reverse. In discharging the load it is not even necessary to raise or dump the body, for the packing plate is merely moved to the extreme rear, pushing out the solidly packed material, which prevents sticking of the refuse by freezing or by its very nature. This body is entirely enclosed and watertight, fulfilling sanitary requirements. Complete information may be secured from Municipal Sanitation Corporation, Bridgeport, Conn.

Lighting Standards Catalog

More than 1,400 different design numbers of pendant lighting standards are illustrated and listed in a new catalog recently issued by The Union Metal Mfg. Co., Canton, Ohio. The designs illustrated employ both the plain round and the fluted type of pole, which can be furnished with or without an ornamental transformer base. The I. E. S. code requirements providing for higher mounting heights have been carefully followed in designing these steel standards.

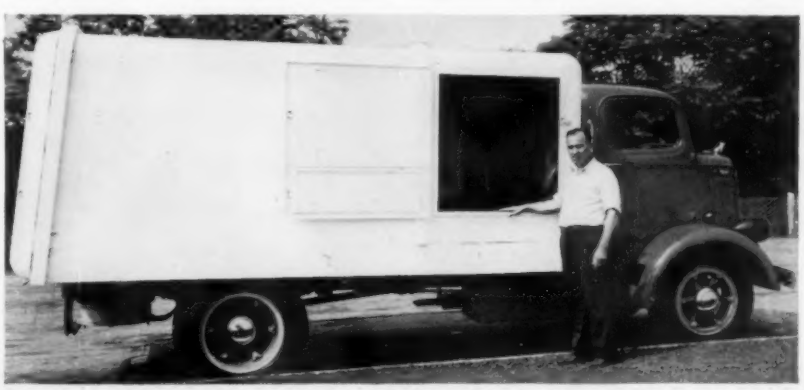
The catalog has been compiled in the manner of an engineering manual. The illustrations are completely dimensioned, and the tables on each page carry supplemental information with respect to pole size, bracket spread, foundation data, etc.

"Modern Designs For Streets and Highways" is the title of this new catalog, known as No. 71. Copies may be secured by readers of THE AMERICAN CITY by writing direct to the manufacturer.

Chain Belt Co. Moves Minneapolis Office

Announcement has been made by the Chain Belt Co. of the removal of its Minneapolis, Minn., office from 808 La-Salle Avenue, to 1645 Hennepin Avenue, Minneapolis, where the company will have increased service facilities.

Chain Belt Co. manufactures sprocket chain belts, conveyors, power transmission equipment, sewage-disposal and water-treatment equipment.



The Kompaka Refuse Body, Showing the Packing Plate Inside at the Front of the Body

Lower Your Sewer Cleaning Costs, with an

O. K.

CHAMPION
Sewer Cleaner

the most economical equipment for the cleaning of sewers 6 inches to 6 feet and over

Write for details on:

- ☐ Power Sewer Cleaner
- ☐ Standard Sewer Cleaner
- ☐ Junior Sewer Cleaner
- ☐ Expansion Buckets
- ☐ Sewer Rods & Accessories

CHAMPION CORPORATION
4716 Sheffield Avenue
Hammond, Indiana

Low Cost Pumping

FOR SEWAGE
RELIFT STATIONS
FILTER BEDS
IRRIGATION
STORM WATER
VIADUCTS
BOOSTER SERVICE

Specialized manufacture means that ECONOMY PUMPS are engineered to your requirements. Constant observance of uniformly high standards are maintained.

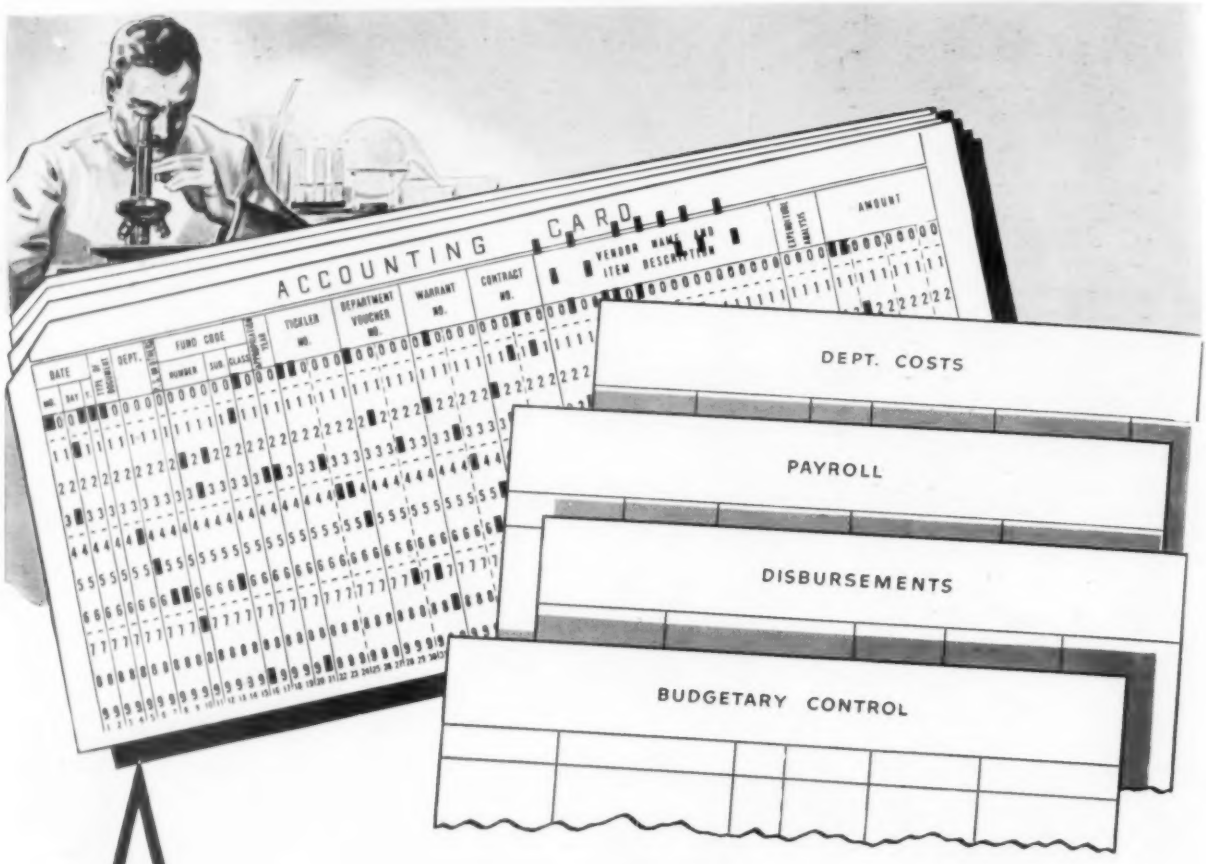
Broad experience and technical skill forms the background of hydraulic and mechanical design. Economy Pumps are built with a stamina to stay on the job and operate with high maintained efficiency.

Sewage and drainage pumps are available in standard sizes up to 35,000-g.p.m. capacities.

The services of our Engineering Staff are available to insure the correct selection and application of pumps to the particular job involved.

Our Pump Data Book contains all the engineering data necessary for the solution of ordinary pump problems. It will be sent free upon request.

ECONOMY PUMPS, Inc.
1000 Weller Avenue Hamilton, Ohio



Analyze Municipal Expenditures

through punched card accounting

As a means of keeping a closer check on all expenditures, governmental administrators are urged to investigate the advantages now offered by the punched card method of accounting. By this method, a basis is established for the allocation of available or anticipated funds and to control departmental expenditures.

Punched cards provide for speed and accuracy in handling Accounts Payable, Equipment Costs, Payroll Accounting, Tax Accounting and numerous other important procedures. Your nearest International Representative will be glad to give you complete information. Call him today.

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IN PRINCIPAL CITIES OF THE WORLD

When you write for that catalog, kindly mention THE AMERICAN CITY.

Clinton E. Stryker

New Vice-President of Nordberg Mfg. Co.

Announcement has been made of the appointment of Clinton E. Stryker as Vice-President and Assistant to the President of the Nordberg Mfg. Co., Milwaukee, Wis. Mr. Stryker is a former partner in McKinsey, Kearney & Co., Management Engineers, of Chicago, Ill. He graduated from the Armour Institute of Technology in 1917, and is a Fellow of the American Institute of Electrical Engineers and a member of the Society of Automotive Engineers.

Foxboro Appoints New Sales Agents

Announcement of the appointment of Bumstead-Woolford as exclusive sales representatives for Foxboro Co., Foxboro, Mass., for the Oregon and Washington territory was recently made by C. E. Sullivan, Vice-President and Sales Manager of Foxboro.

The firm of Bumstead-Woolford was recently formed by Dale Bumstead and O. H. Woolford, both of whom have wide experience and long records of experience in the field of industrial engineering. The new firm has established its head office at 1411 Fourth Avenue, Seattle, Wash., and has also taken over the former Foxboro Co. office at Portland, Ore., at 301 Lewis Building.

Power-Driven Lawn Sweepers

Lawn sweeping tends to beautify the lawn by giving it new life. The Springfield line of lawn sweepers is adaptable for golf greens, parks, parkways, and municipal lawns and for cleaning up around school buildings.

Crab grass is an annual which seeds itself, and on each plant there are from 1,000 to 1,200 seeds which germinate 80 per cent. Collecting the seeds late in the fall is an effective method of crab-grass control. The seeds of the crab grass are light and easily collected by the use of a Springfield lawn sweeper, either power- or hand-driven. The suction created by the brushes lifts and collects the seeds, raising the plant so that the seed pods may be cut off before they ripen, and later be collected and burned.

Springfield sweepers, manufactured by the Moto-Mower Co., 4600 Woodward Ave., Detroit, Mich., also collect grass cuttings, sticks, stones and other trash and give a lawn a well-kept appearance. These sweepers may be used for brushing-in top dressing.

Water Aeration by Air Diffusion

Water aeration by air diffusion through porous plates and tubes is probably an outgrowth of, and due to, the improvements in sewage aeration by the same method, which has been a standard practice for many years. Results obtained with this method of water aeration have been: satisfactory reduction or removal of entrained carbon dioxide, hydrogen sulphide and other gases; odor reduction and some improvement in taste, depending on the quality of the raw water; the conversion of the iron content in water to its hydroxide form for easy removal, and positive and thorough mixing of chemicals, thus providing an economical solution where both aeration and chemical mixing are required.

The degree of aeration can be varied to meet fluctuations in raw-water quality by varying the amount or quantity of air diffusion, and practically no head of water is required to operate diffused air units, which permits their construction at the same elevation as other elements of a plant. This simplifies design and decreases construction costs, making the installation and operation costs of diffuser air plants comparatively low. These units can be operated in freezing weather without ice trouble.

Aloxite Brand porous diffusers have been used in most diffused air, water aeration-mixing units. They are produced by The Carborundum Co., Niagara Falls, N. Y., are uniformly porous and discharge bubbles from the entire surface; are so made that the bubbles diffused are small; are resistant to corrosion and are strong and durable. The materials used in the production of these diffusers are the same as those used in the manufacture of grinding wheels and other abrasive products.

The Porous Products Department of The Carborundum Co. is conducted by sanitary engineers, trained to serve consulting engineers, water-works and sewage-plant superintendents, contractors and municipal officials, and will assist with any special design or structural problems.

Engineering Bulletin No. 1 issued by The Carborundum Co. contains much valuable data on aeration of water and sewage with porous diffuser plates and tubes, including standard specifications of these diffusers. This Bulletin, together with a reprint of an article by Frank C. Roe, Sanitary Engineer, The Carborundum Co., may be secured upon request.

BUILDERS

IMPROVED METERING AND CONTROLLING EQUIPMENT

THE FLO-WATCH

is the meter that gives you the facts—at low cost.

IT WILL HELP YOU:

1. Eliminate Waste
2. Check Pump Operation and Efficiency
3. Check Boiler Efficiency
4. Meter Distribution Lines

An investment in a Flo-watch Meter may easily pay an 100% dividend through savings effected.

Ask for Bulletin 318

BUILDERS - PROVIDENCE
IRON FOUNDRY RHODE ISLAND

The MOST DEMANDED PUMPS IN AMERICA
—for deep well service

Up, up, up go the sales of Peerless Pumps for 1940. Peerless Pump plants have reached peak capacity but can still make prompt deliveries. It's the EXTRA features offered that have caused this growing demand for Peerless Pumps. Bulletin gives full details.

PEERLESS PUMP DIVISION
FOOD MACHINERY CORPORATION
Factories: LOS ANGELES, SAN JOSE, FRESNO, CALIF. and MASSILLON, OHIO

PEERLESS
Turbine & Hi-Lift
PUMPS

GAR WOOD SERVES the Nation's Municipalities

Gar Wood truck and trailer equipment—including Dump Bodies and Hoists (both hydraulic and mechanical), Garbage and Rubbish Units, Winches and Cranes, Tanks, Flushers, Sprinklers, and also road machinery including Trailbuilders, Bulldozers, Tamping Rollers, Rippers and Scrapers—is universally recognized as the most dependable, efficient and economical for municipal requirements and for more productive hours.

The name Gar Wood is assurance of unexcelled performance, according to the nation's present municipal users of Gar Wood products. Drawing from a long-time experience covering more than a quarter of a century, Gar Wood engineers are at your service to assist in planning your needs.

Ask for Load-Packer **Bulletin 27,** also **Bulletin 12** featuring a variety of collection units.

The Modern
GAR WOOD
LOAD-PACKER

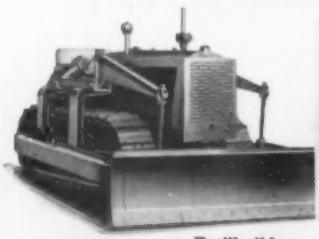
The all-enclosed Gar Wood Load-Packer is the newest, fastest, most sanitary and economical unit for collecting and hauling garbage and rubbish—compresses all types of garbage and rubbish, allowing for a greater and more compact load.

SEE THE GAR WOOD EXHIBIT
at the
AMERICAN PUBLIC WORKS CONVENTION
Detroit, Michigan, September 30th, October 1st, 2nd
Gar Wood Headquarters at the Book-Cadillac Hotel
BOOTHS 21 and 22
...Also Load-Packer and Tree-Moving Crane Demonstrations on Washington Boulevard (in front of Hotel)
A cordial invitation to visit the Gar Wood plants is extended to all attending the Convention.

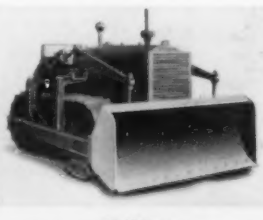
This combination unit is widely used by municipalities. Consists of a Gar Wood Winch and Crane, Hoist and Dump Body—all mounted on one truck. Used for handling hydrants, lighting poles, pipes, steel rails, timber, boulders, sand, gravel and for general hauling.
Ask for **Bulletins W147, W141A and 25.**

The streamlined Gar Wood 3-nozzle Street Flusher (2 sprinkler nozzles at rear.) Clean streets are one of the most important requirements for protecting civic health. Ask for **Bulletin FL-601,** also general **Bulletin 602T.**

Gar Wood offers the most complete line of road machinery including Trailbuilders and Bulldozers (shown below). The Trailbuilder blade raises and lowers and can be set for right- or left-side casting—speeds up trench work. The Bulldozer provides power up and down on blade with quick control to regulate cut—used extensively around rubbish dumps, incinerators and for street and construction work.
Ask for Road Machinery literature

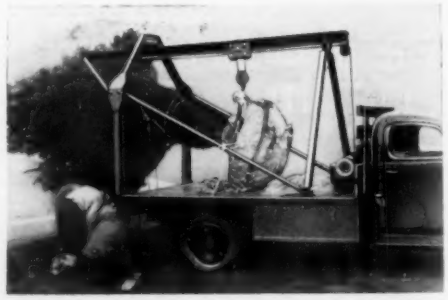


Trailbuilder



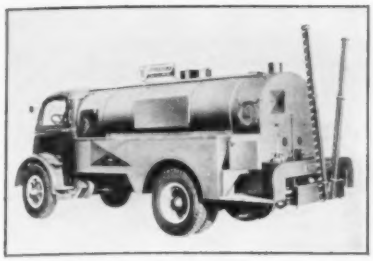
Bulldozer

Repair Tower. For tree care, street light and power line maintenance.



The Gar Wood "Q-D" Quick-Detachable Tree-Moving Crane Unit quickly picks up, transports and resets tree balls up to 6 feet in diameter and 3 tons in weight. Can be mounted or demounted in ten minutes. Ask for **Bulletin W148A.**

GAR WOOD INDUSTRIES, INC.
7924 Riopelle Street • DETROIT, MICHIGAN, U. S. A.
WORLD'S LARGEST MANUFACTURER OF TRUCK AND TRAILER EQUIPMENT • *BRANCHES AND DISTRIBUTORS EVERYWHERE*
Hoists and Bodies • Truck Tanks for Fuel Oil, Gasoline, Milk and other Liquids • Winches and Cranes
Roadbuilders • Bulldozers • Scrapers • Tamping Rollers • Rippers



The Littleford Sprayer

Pressure Distributor for Bituminous Materials

The Spray Master pressure distributor, manufactured by Littleford Bros., 457 East Pearl Street, Cincinnati, Ohio, is designed to make the application of bituminous materials simple, efficient and economical. The Spray Master has a front engine and a rear pump with straight drive shaft with two universals on the shaft, giving equal load distribution. The air-cooled flue liner prevents overheating of the flue. The hydraulic ground clearance adjustment raises and lowers the spray bars to any given position, thus keeping the spray nozzles in a position perpendicular to the road surface, and giving a streakless application, regardless of viscosity of light or heavy application. The operating control is at the operator's platform.

The pump is non-pulsating, with a capacity of 400 gallons at 400 rpm and has an outboard bearing and ball thrust bearing adjustment. One hand wheel controls all operations. The heat chamber, at the rear of the Spray Master, thaws out the pump and short pipe lines by deflecting the heat of the burner into the heat chamber.

There are four types of spray bars designed for use with the Littleford Spray Master: the Standard spray bar, a tubular bar with two feed lines, one to each half of the bar; the Type A bar, a center-folding, single feed line bar, with cut-off valves in each section; Type B, a 2-inch tubular, center-folding bar with side angle ball check cut-off valves in each nozzle; and the Type C, a full circulating spray bar with side angle ball check cut-off valves in each nozzle. All bars have the Littleford suck-back principle and can be used with extensions up to 24 feet.

Companion units for the Spray Master are the Tankar heater and the bituminous resurfacer. The Tankar heater is a steam production unit which evaporates enough steam to generate 30 hp. The resurfacer will mix and level off mixed-in-place surfaces in one pass, averaging 1 mile per hour.

Booklet on Sub-Drainage

The Toncan Culvert Manufacturers Association, of Cleveland, Ohio, has released a 32-page booklet which will be of interest to engineers and public officials concerned with the problems of sub-drainage. This booklet is profusely illustrated with tables, diagrammatic sketches, and actual installation photographs. Also, the principles and requirements of modern sub-drainage systems are outlined. Copies of this booklet may be secured upon request.

Hon. Harold Burton (right), Mayor of Cleveland, Ohio, Miles Evans (center), Service Director of the city, and Ralph A. Taggart, of Autocar Co., standing in front of one of the eight new Special Model C30 Autocar trucks with drop frames equipped with 8-cubic-yard Wood garbage bodies and telescopic hoists. At the same time the city of Cleveland purchased three Model V30 Autocars equipped with Refuse-Getter bodies, and two model V30 Autocars with 6-man cabs and Elgin refuse bodies

SYNTRON
"GRAVIMETRIC"
FEEDER MACHINES
for Accurate
Dependable
Dry Chemical Dosage
by Weight

SYNTRON
"VOLUMETRIC"
FEEDER MACHINES
for Automatic
Dry Chemical Dosage
from Flow Meter or
pH Indicator Control
SYNTRON COMPANY
430 LEXINGTON AVE., HOMER CITY, PA.

DE LAVAL
Self-Priming
PUMPS

IN addition to the high efficiency, accessibility, interchangeability and renewable wearing parts to shield main pump parts, for which De Laval pumps are famous, pump users can now have an

Automatic Self-Primer

which keeps pump, suction line and all connections continuously primed, so that the pump will deliver whenever the motor is started.

This improvement is available for (1) individual pumps, (2) multiple pumps with (a) separate suctions or (b) a common suction header, (3) single or multiple pumps drawing from wells through a sand and air chamber, (4) sewage pumps and (5) pumps on shipboard.

Ask for paper P-3213.

De Laval Steam Turbine Co.
Trenton, N. J.

BETTER CONCRETE IN SHORTER TIME WITH CALCIUM CHLORIDE IN THE MIX

The Results of Actual Field Tests Show

● 63% GREATER 3-DAY STRENGTH

Follow the arrow No. 1; note that concrete with calcium chloride had 675 lbs. transverse strength at 3 days (well above usual state requirements for pavement opening) as against 415 lbs. for plain concrete, a gain of 63% by use of calcium chloride.

● 4-HOUR REDUCTION IN FINISHING TIME

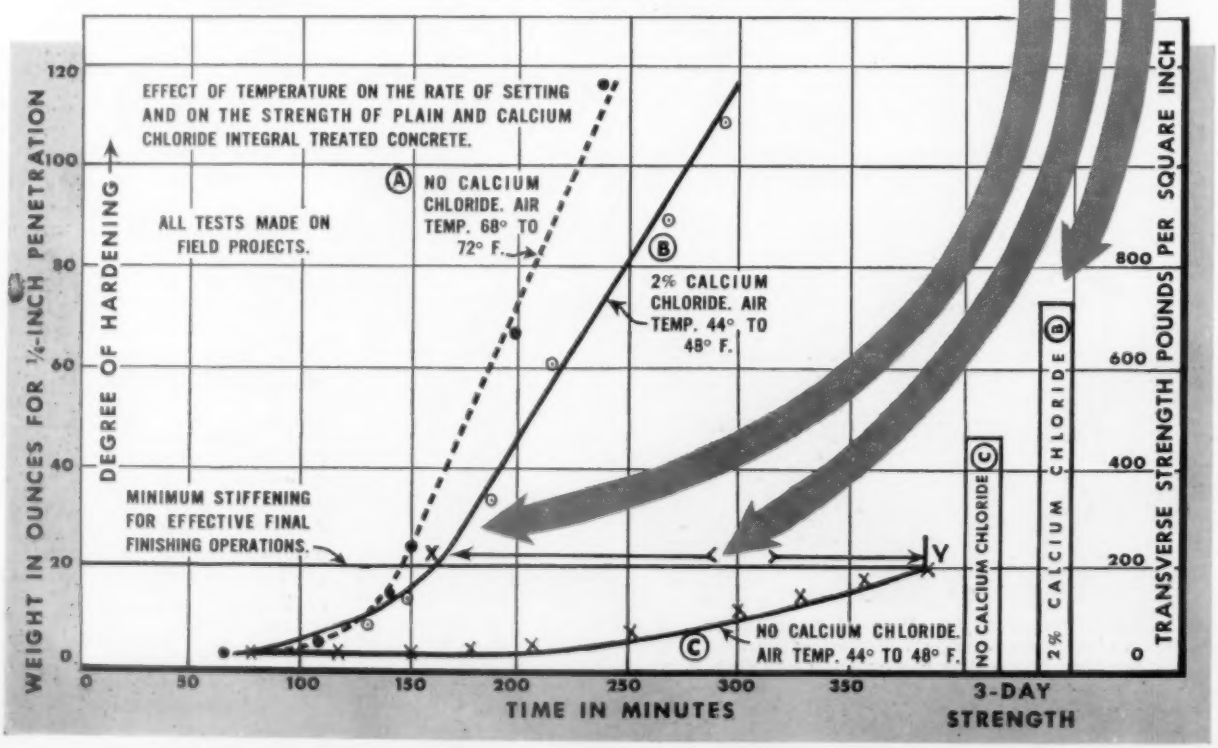
The reduction in time to reach minimum stiffening for effective final finishing shown at the point of arrow No. 2 — X to Y — approximately four hours — permits, as in this case, a saving in finishing costs sufficient to pay for the calcium chloride.

● MAKES UP 24° TEMPERATURE DIFFERENCE TO GIVE IDEAL CONDITIONS

Follow arrow No. 3; note that calcium chloride treated concrete placed at air temperature of 44-48° acquired necessary stiffness for finishing in almost exactly the same time as plain concrete placed at air temperature 70°. Calcium chloride thus practically offsets the usual considerable strength losses in concrete poured at from 60 down to 40 degrees.

To attain these beneficial results is both economical and simple. Two pounds of calcium chloride (costing 2 to 3 cents) per bag of cement should be added to the concrete mix, and can be introduced, in flake form, directly into the skip. Innumerable field tests have shown that the addition of calcium chloride will produce normal summer reaction in cold weather concrete, with correspondingly high early strength, thus permitting earlier finishing and quicker removal of forms. It will also improve density and water resistance, make concrete flow and fill forms better and produce the high early strength so important in cool to freezing temperature ranges. A detailed description of the penetration apparatus and procedure used in these tests, and literature on the use of calcium chloride in concreting are available on request.

CALCIUM CHLORIDE ASSOCIATION
4145 PENOBSCOT BUILDING, DETROIT, MICHIGAN



G. E. Long

Koehring Company Elects G. E. Long President

W. J. Koehring, who has been President of the Koehring Co., Milwaukee, Wis., for 33 years, has resigned and is now Chairman of the Board of the company. G. E. Long, who is succeeding Mr. Koehring as President, has been Treasurer since 1932. He became associated with the company in 1928 and has acted as Secretary, Sales Manager, and General Manager, in recent years.

C. A. Koehring remains as Vice-President, and P. Graser has been elected Secretary-Treasurer.

Completely Equipped Field Service Truck

A service truck completely equipped with all the necessary tools, lubricants and test apparatus to handle the field maintenance of EMCO and Nordstrom products is being operated out of the Chicago office of the Pittsburgh Equitable Meter Co., and the Merco Nordstrom Valve Co., a subsidiary, for the convenience of their customers in the Mid-West. This service truck is in charge of Paul Payton, Service Engineer. Captain A. E. Higgins, Sales Manager, has also announced that plans are being made to place additional service trucks in other sections of the country in the near future.

Pittsburgh, Pa., Has New Garbage-Collection Fleet

Pittsburgh, Pa., recently added 80 new units to its garbage-collection fleet. The special bodies, made by The Heil Co., Milwaukee, Wis., measure 138 inches in length on the top, 162 inches in length on the bottom, 81 inches in width at the front, 84 inches in width at the rear, and 60 inches in height, and have an enclosed volume of 15 cubic yards. Each body is equipped with hinged side boards and curtain doors made by Kinnear Manufacturing Co. Heil Twin-Cylinder hydraulic hoists raise and lower the bodies for quick dumping operation, while a single-acting, hydraulically operated tailgate permits easy dumping of the body load.

The chassis of these units, furnished by the White Motor Co., are equipped with 318-inch engines and have various features based upon the requirements of the refuse collection service in the Pittsburgh territory.

One of Pittsburgh's New Garbage Collecting Units

Municipal Index Omission

The attention of our readers is called to the fact that the Classified Directory Section of The Municipal Index for 1940-41 should have included Proportioneers, Inc., 9 Codding St., Providence, R. I., under the headings of

Chemical re-agent feeders
Hypo-chlorinators
Chlorine testing equipment

Paul Payton and the EMCO-Nordstrom Service Truck

RUSTA-RESTOR TRADE MARK REGISTERED
PATS PEND

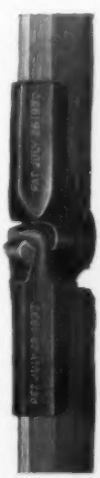
STOPS RUST in STEEL WATER TANKS and FILTER BEDS

by the only known means of positive prevention

Write for circular describing this method

RUSTA RESTOR CORP.
1450 W. State Street
FREMONT OHIO

Since 1901
STEWART
America's Finest
SEWER RODS



- Sewer Cleaning Tools
- Sewer Cleaning Machines
- Sewer Cleaning Buckets
- Root Cutters

"Let Stewart answer your sewer cleaning problems"

Write for catalog

W. H. STEWART
P. O. Box 767, Syracuse, N.Y.
P. O. Box 581, Jacksonville, Fla.
779 Argyle Rd., Windsor, Ontario, Canada

LIKE more than 3500 American police departments, Birmingham has found that Harley-Davidson Police Motorcycles best meet the severe and exacting demands of traffic control and law enforcement. Years of service-proved performance, plus a continuous succession of exclusive engineering advancements, have won for Harley-Davidsons their undisputed leadership in police work. Their wide range of usefulness, superior power and stamina, ease of operation and low maintenance cost are the result of long experience, unusual engineering skill and quality workmanship. Equip your squads for top efficiency. Specify Harley-Davidson Police Motorcycles. Phone your Harley-Davidson dealer today — have him bring over one of the latest models for your inspection.

HARLEY-DAVIDSON MOTOR CO., ***Milwaukee, Wisconsin, U. S. A.***

HARLEY-DAVIDSON
THE POLICE MOTORCYCLE

Portable Concrete Mixer

Easily Operated Concrete Mixer

Flexibility of movement, ease of operation, thorough mixing action and high production capacity are features of the 3½-S Trail-Mix concrete mixer, a product of Kwik-Mix Concrete Mixer Co., Port Washington, Wis.

The drum is easily tilted, and an easily applied friction brake holds it in any discharge position. The drum returns automatically to its charging position through counterbalancing. The stop location can be changed by moving an adjustable lug. The 3½-S end-discharge mixer weighs only 930 pounds, is easy to handle, and can be trailed at high automobile speed. One man can move the mixer on the job, and its compact design permits spotting in tight corners. The Kwik-Mix has welded construction in the frame, drum and axle.

An air-cooled engine, housed for protection from dirt, prevents freezing of water and broken engine blocks in cold weather, and overheating by water boiling away. The drive shaft, revolving shaft and pneumatic-tired wheels have anti-friction bearings. Since all grease is forced outward, dirt and grit cannot enter the bearings.

The 3½-S Trail-Mix and other concrete and plaster-mortar mixers, and hot and cold patch bituminous mixers, are described and illustrated in a new catalog recently released by the manufacturer.

Airport Lighting Contract Awarded to Westinghouse

Receipt of the final contract award for the lighting of the Washington National Airport, formerly the Gravely Point Airport, has been announced by the Lighting Division of the Westinghouse Electric & Manufacturing Co., of Pittsburgh, Pa. The complete lighting equipment represents an order of $100,000 and is said to be the largest amount of lighting ever installed on one port.

Included in the list of equipment are some 400 contact lights of different colors for traffic and landing control, boundary lights, obstruction, range and floodlights; the airport beacon light, ceiling projector and interior fixtures for the administration building and hangars. The order covers complete control equipment for the installation, which will include a main control desk from which every light on the field may be operated.

Westinghouse engineers are developing a new type of wind indicator, to be known as a "smoke pot," to take the place of the conventional wind tee.

Gas Mask with All-Vision Facepiece

In a new bulletin recently issued by the Mine Safety Appliances Co., Pittsburgh, Pa., announcement is made of the addition of the MSA all-vision facepiece to the MSA All-Service gas mask. This facepiece features non-fogging, and large area lenses of laminated shatterproof glass. The accumulation of fog and moisture is prevented by incoming dry air being conducted over the lenses. Maximum vision is permitted at all seeing-angles. The unit fits any face with perfect gas-tight seal eliminating pressure points, and minimum dead air space inside the facepiece cuts down re-breathing of air. The molded rubber facepiece can be sterilized without harm.

Easily and quickly put on or removed, the canister harness is made of strong, durable materials and is adjustable to any required size. The canister is specially designed to assure easy breathing and maximum efficiency of the contents. It is provided with chemicals for absorbing or rendering harmless all-poisonous industrial gases, smoke and vapors. The exhalation valve strategically placed in direct path of exhaled air, permits free head movement in all directions. An exclusive feature of the MSA All-Service mask is the timer, a simple and positive device that indicates the service time undergone by the canister, thus eliminating all guesswork. When the hand on the dial, which is always visible, makes one complete revolution, a new canister must be used. This timer is a vital necessity where carbon monoxide is encountered, since it removes all doubt as to the condition of the canister for protection from this gas.

Copies of Bulletin EA-6 describing the All-Service mask and the new All-Vision facepiece may be secured by writing direct to Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh, Pa.

The M. S. A. All-Service Gas Mask

MUNICIPAL

Refuse Collection Equipment

"Kompaka"

Loading—Compressing—Discharging
Simple—Easy—Fast

•

"Model D"

Its enclosed steel body, with openings rubber sealed, makes it completely odor proof and leak proof. Garbage always out of sight and smell.

•

"Colecto"

The Municipal Refuse Collector is completely *hydraulically operated.* It eliminates all complex mechanical operating mechanisms.

Write for Catalogs

Municipal Sanitation Corp.
Bridgeport, Conn.

The man behind the wheel

TWENTY-FOUR hours a day streets and highways are alive with trucks transporting goods vital to the needs of a nation. On the man behind the wheel of this vast fleet rests a great responsibility. It is his job to keep this stream of commerce moving safely and on schedule to its destination.

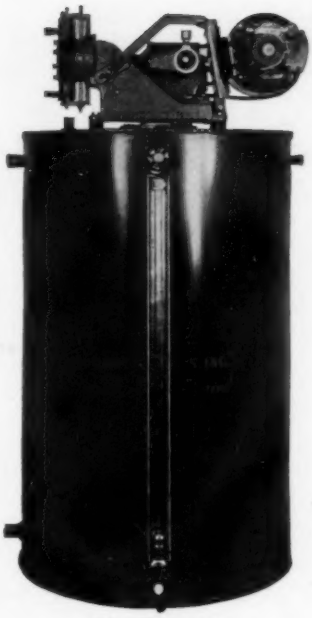
• Employees of private enterprise, these drivers are also public servants in the truest sense. We prize their good-will. We are proud to be their co-workers in a great public service. And, valuing their sound judgment of trucking equipment, we try to build the kind of trucks they want.

• We pay our respects to these men—as they so often pay their respects to the trucks we build.

Ford

FORD MOTOR COMPANY

When you write for that catalog, kindly mention THE AMERICAN CITY.



The Packaged Amm-O-Feeder

Packaged Ammoniation Now Available

A new unit consisting of complete ammoniation equipment for water plants using up to 30 pounds of NH_3 per day has been announced by Proportioneers, Inc., 9 Codding Street, Providence, R. I. Known as the Amm-O-Feeder, this new unit is adaptable to almost any plant ranging in size from a small one serving a population of 2,500 to one serving a half-million population.

The Amm-O-Feeder is recommended by the manufacturers for swimming pools, since it can be safely handled and operated by non-technical operators.

The heavy-duty Midget Amm-O-Feeder consists of a motor on four Vibro insulators mounted on a 68-gallon black iron tank, 21 inches in diameter and 34 inches high. The tank is equipped with a gage glass with a metal scale reading in inches which can be converted to gallons. Other apparatus included in the Amm-O-Feeder are a drum drain piping assembly with air-valve connection for the pump; a hand-type air pump; and a standard set of accesssories for ammoniation, including spare diaphragm, visible sight feeder, spare check-valve parts and an injection nozzle check.

Ease of operation is a feature of the Amm-O-Feeder. By removing the plug from the drum of aqua ammonia and connecting with the drum drain assembly; connecting two unions; opening the plug cock in the ammonia line; pumping air into the drum, displacing ammonia into diluting and feeding tank; opening the water valve to allow the required amount of diluting water to flow in; setting the belt on the proper pulley and the stroke adjustment on the variable eccentric, the Amm-O-Feeder is ready for operation by simply plugging the electric cord into the current outlet.

Charles F. Mebus, Eminent Engineer, Dies

Charles F. Mebus, eminent engineer, died at his home 5 West Oakdale Avenue, Glenside, Pa., on June 28, 1940. Mr. Mebus was born in Nazareth, Pa., January 7, 1865 and received his engineering training at Valparaiso University, Lafayette College and Vanderbilt University.

Mr. Mebus was a member of numerous societies and clubs, among them the American Society of Civil Engineers. Until his death, he served as Engineer for a number of boroughs and townships in Pennsylvania. He is survived by his wife, two daughters and two sons.

New Schramm Dealer

Schramm, Inc., of West Chester, Pa., has announced the appointment of Northrop and Company, Inc., 50 North Church Street, New York, as distributor of Schramm equipment and compressors for water-works and utility companies.

Roots-Connersville Pump Business Sold

The Roots-Connersville Blower Corporation, Connersville, Ind., has announced the sale of its turbine pump business to the Sterling Pump Corporation, Hamilton, Ohio, which will manufacture and sell this line of pumps under its name.

PLASTEX

COAL TAR BASE

PROTECTIVE COATINGS

***for* WATERWORKS & SEWERAGE**

PLASTEX *Primer & Enamel*

. . . for coating and lining Steel Pipe and lining Cast Iron Pipe. Permanently prevents corrosion, incrustation and tuberculation.

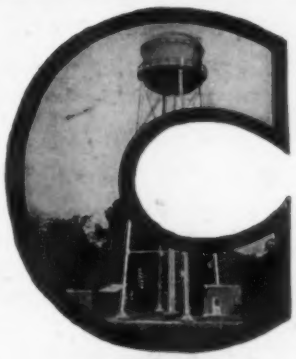
PLASTEX *Unicoat*

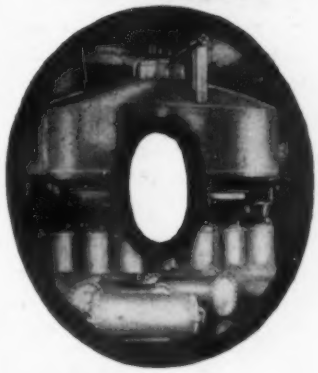
. . . A cold application lining for Concrete Pipe, Tanks, etc., and for waterproofing all types of masonry.

Your inquiries are invited.

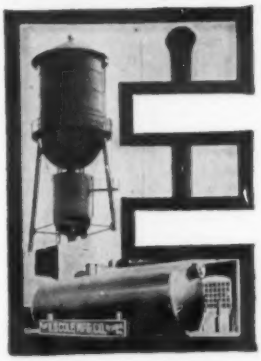
STEEL PROTECTION & CHEMICAL CO., Inc.
MOORESVILLE, IND.

Tank Builders For Over 80 Years!





Tanks, Towers, Kettles, Kiers, Vats, Vessels, Bins, Boilers, Stacks, Standpipes and other fabricated plate-work from your specifications or ours.



Write for "Tank Talk" — 6-A, or let us figure on your requirements.

R.D.COLE MFG.CO.
Established in 1854
NEWNAN · · · GEORGIA

A "Short Cut" for the Busy Buyer

CITY OF ST. LOUIS

DEPARTMENT OF PUBLIC UTILITIES

311 CITY HALL

BERNARD F. DICKMANN
MAYOR

EDWARD E. WALL.
DIRECTOR

August 23, 1940

Mr. Geo. S. Conover, Vice-President
American City Magazine
New York City

Dear Sir:

I beg to acknowledge with thanks the receipt of the 1940-41 Municipal Index and Atlas which was received today. It is kept where the entire technical force of the Department of Public Utilities can consult it for information about water supply, purification and distribution, and about street lighting costs and equipment, generators, motors, etc. We find the maps very useful and they are often referred to,- in fact the whole Index is in continuous service.

Again thanking you for your kindness in sending us this valuable book, I am

Yours truly,

Edward E. Wall

EEW JM

Director of Public Utilities.

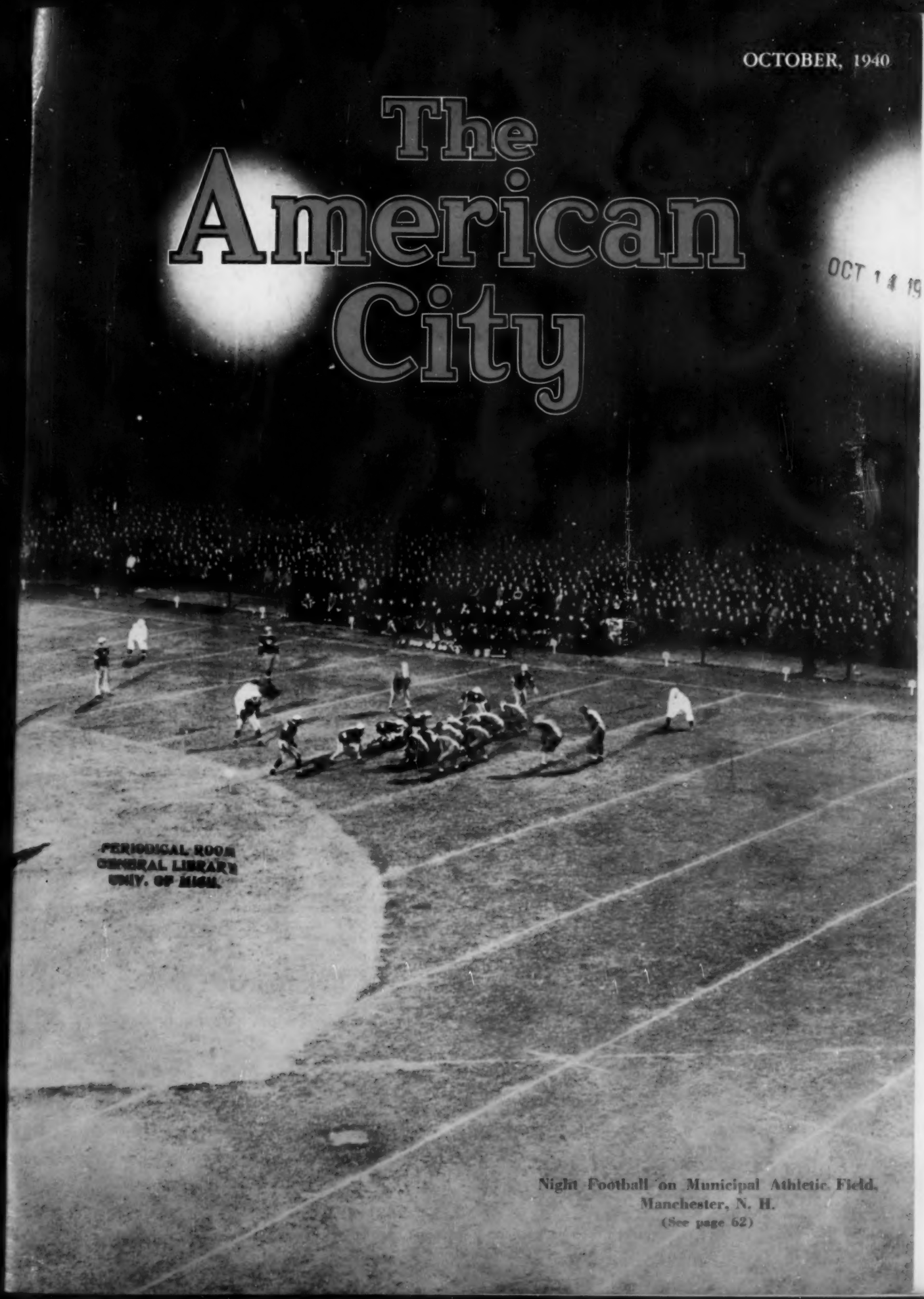
"Any manufacturer who does not use adequate space in the Municipal Index to illustrate and describe his products for municipal and water works uses is overlooking one of the most efficient means of gaining effective sales producing publicity."

THE MUNICIPAL INDEX
470 Fourth Ave., New York

OCTOBER, 1940

The American City

OCT 1 4 19



PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

Night Football on Municipal Athletic Field,
Manchester, N. H.
(See page 62)